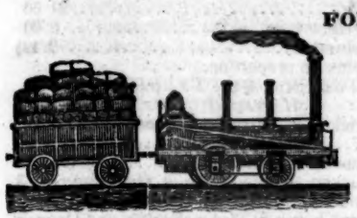
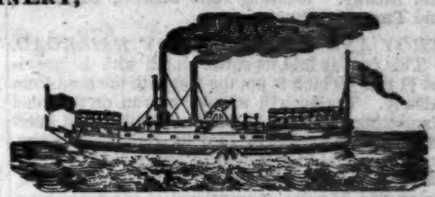
AMERICAN RAILROAD JOURNAL,

AND GENERAL ADVERTISER

FOR RAILROADS, CANALS, STEAMBOATS, MACHINERY, AND MINES.



ESTABLISHED 1831.



PUBLISHED WEEKLY, AT No. 23 CHAMBERS STREET, NEW YORK, AT FIVE DOLLARS PER ANNUM.

SECOND QUARTO SERIES, VOL. II., No. 35.] SATURDAY, AUGUST 29, 1846. [WHOLE No. 532, VOL. XIX.

BOSTON AND PROVIDENCE RAILroad. Passenger Notice. Summer Arrangement. On and after Monday, April 6, 1846, the Passenger Trains will run as follows:

For New York—Night Line, via Stonington. Leaves Boston every day, but Sunday, at 5 p.m.

Accommodation Trains, leave Boston at 7½ a.m. and 4 p.m., and Providence at 8 a.m. and 4½ p.m.

Dedham trains, leave Boston at 8 a.m. 12½ m., 3½ p.m., and 6½ p.m. Leave Dedham at 7 a.m. and 9½ a.m. and 2½ and 5½ p.m.

Stoughton trains, leave Boston at 11½ a.m. and 5½ p.m. Leave Stoughton at 7·20 a.m. and 3½ p.m.

All baggage at the risk of the owners thereof.

31 1y W. RAYMOND LEE, *Sup't.*

BRANCH RAILROAD and STAGES CONnecting with the Boston and Providence Railroad.

Stages connect with the Accommodation trains at the Foxboro' Station, to and from Woonsocket. At the Seekonk Station, to and from Lonsdale, R. I. via Pawtucket. At the Sharon Station, to and fr m Walpole, Mass. And at Dedham Village Station, to and from Medford, via Medway, Mass. At Providence, to and from Bristol, via Warren, R. I.—Taunton, New Bedford and Fall River cars run in connection with the accommodation trains.

NORWICH AND WORCESTER RAILRoad. Summer Arrangement, commencing Monday, April 6, 1846.

Accommodation Trains, daily, except Sunday. Leave Norwich, at 6 a.m., and 4½ p.m. Leave Worcester, at 10 a.m., and 4½ p.m.

☞ The morning Accommodation Trains from Norwich, and from Worcester, connect with the trains of the Boston, and Worcester and Western railroads each way.

The Evening Accommodation Train from Worcester connects with the 1½ p.m. train from Boston.

New York Train via Long Island Railroad:

Leave Allyn's Point for Boston, about 1 p.m., daily, except Sunday.

Leave Worcester for New York, about 10 a.m., stopping at Webster, Danielsonville, and Norwich.

New York Train via Steamboat—Leave Norwich for Boston, every morning, except Monday, on the arrival of the stamboat from New York, stopping at Norwich and Danielsonville.

Leave Worcester for New York, upon the arrival of the train from Boston, at about 4½ p.m., daily, except Sunday, stopping at Webster, Danielsonville and Norwich.

Freight Trains daily each way, except Sunday.—Special contracts will be made for cargoes, or large quanties of freight, on application to the superintendent.

☞ *Fares are Less when paid for Tickets than when paid in the Cars.* ☜

32 1y J. W. STOWELL, Sup't.

BOSTON AND MAINE RAILROAD. Upper Route, Boston to Portland via, Reading, Andover, Haverhill, Exeter, Dover, Great Falls, South & North Berwick, Wells, Kennebunk and Saco.

Summer Arrangement, 1846.

On and after April 13, 1846, Passenger Trains will leave daily, (Sundays excepted,) as follows:

Boston for Portland at 7½ a.m. and 2½ p.m.

Boston for Great Falls at 7½ a.m., 2½ and 4½ p.m.

Boston for Haverhill at 7½ and 11½ a.m., 2½, 4½ and 6 p.m.

Boston for Reading at 7½, 9, and 11½ a.m., 2½, 4½, 6 and 8 p.m.

Portland for Boston at 7½ a.m., and 3 p.m.

Great Falls for Boston at 6½ and 9½ a.m., and 4½ p.m.

Haverhill for Boston at 6½, 8½, and 11 a.m., and 4 and 6½ p.m.

Reading for Boston at 6½, 7½ and 9½ a.m., 12 m., 1½, 5 and 7½ p.m.

The Depot in Boston is on Haymarket Square.

Passengers are not allowed to carry Baggage above $50 in value, and that *personal* Baggage, unless notice is given, and an extra amount paid, at the rate of the price of a Ticket for every $500 additional value.

CHAS. MINOT, *Super't.*

NEW YORK & HARLEM RAILROAD CO.—Summer Arrangement.

On and after Friday, May 1st, 1846, the cars will run as follows:

Leave City Hall for Yorkville, Harlem and Morrianna, at 7, 8, 9, 10 and 11 a. m., and at 1, 2, 3 30, 4 30, 5, 6, and 6 30 p. m.

Leave City Hall for Fordham and Williams' Bridge, at 7, 10 and 11 a. m., and at 2, 3 30, 5, and 6 30 p. m.

Leave City Hall for Hunt's Bridge, Bronx, Tuckahoe, Hart's Corners and White Plains, at 7 and 10 a. m., and at 2 and 5 p. m.

Leave Harlem and Yorkville, at 7 10, 8 10, 9, 10, 11 10 a. m., and at 12 40, 2, 3 10, 5 10, 5 30, 6 10, and 7 p. m.

Leave Williams' Bridge and Fordham, at 6 45, 7 45, and 10 45 a. m., and at 12 15, 2 45, 4 45, and 5 45 p. m.

Leave White Plains, at 7 and 10 a. m., and at 2 and 5 p. m.

The freight train will leave the City Hall at 1 o'clock, p. m., and leave White Plains at 1 o'clock in the morning.

On Sundays, the White Plains train will leave the City Hall at 7 a. m. and 5 30 p. m.; will leave White Plains at 7 a. m. and 6 p. m.

On Sundays, the Harlem and Williams 'Bridge trains will be regulated according to he state of the weather. 18

SUMMER ARRANGEMENT.—NEW YORK AND ERIE RAILROAD LINE, from April 1st until further notice, will run daily (Sundays excepted) between the city of New York and Middletown Goshen, and intermediate places, as follows:

FOR PASSENGERS—

Leave New York at 7 A.M. and 4 P.M.
" Middletown at 6½ A.M. and 5½ P.M.

FARE REDUCED to $1 25 to Middletown—way in proportion. Breakfast, supper and berths can be had on the steamboat.

FOR FREIGHT—

Leave New York at 5 P.M.
" Middletown at 12 M.

The names of the consignee and of the station where to be left, must be distinctly marked upon each article shipped. Freight not received after 5 P. M. in New York.

Apply to J. F. Clarkson, agent, at office corner of Duane and West sts. H. C. SEYMOUR, Sup't.

March 25th, 1846.

Stages run daily from Middletown, on the arrival of the afternoon train, to Milford, Carbondale, Honesdale, Montrose, Towanda, Owego, and West; also to Monticello, Windsor, Binghamton, Ithaca, etc., etc. Agent on board. 13 tf

BOSTON AND ALBANY.—WESTERN RAILROAD.—Fare Reduced.

1846..Spring Arrangement..1846

Commencing April 1st.

Passenger trains leave daily, Sundays excepted—

Boston	7½ p. m. and 4 p. m.	for Albany.
Albany	6½ " and 2½ "	for Boston.
Springfield	7 " and 1 "	for Albany.
Springfield	7 " and 1½ "	for Boston.

Boston, Albany and Troy:

Leave Boston at 7½ a. m., arrive at Springfield at 12 m., dine, leave at 1 p. m., and reach Albany at 6½ p. m.

Leave Boston at 4 p. m., arrive at Springfield at 8 p. m., lodge, leave next morning at 7, and arrive at Albany at 12½ m.

Leave Albany at 6½ a. m., arrive at Springfield at ½ m., dine, leave at 1½ p. m., and arrive at Boston 6½ p. m.

Leave Albany at 2½ p. m., arrive at Springfield at 8½ p. m., lodge, leave next morning at 7, and arrive at Boston at 12 m.

The trains of the Troy and Greenbush railroad connect with all the above trains at Greenbush.

Fare from Boston to Albany, $5; fare from Springfield to Boston or Albany, $2 75.

Merchandize trains run daily (Sundays excepted) between Boston, Albany, Troy, Hudson, Northampton, Hartford, etc.

For further information apply to C. A. Read, agent, 27 State street, Boston, or to S. Witt, agent, Albany.

JAMES BARNES,
Superintent and Engineer.

Western Railroad Office, Springfield, April 1, 1846. 14 1y

TROY RAILROADS.—IMPORTANT NOTICE.—Troy and Greenbush Railroad, forming a continuous track from Boston to Buffalo and Saratoga Springs.

This road is new, and laid with the heaviest iron H rail. Trains will always be run on this road connecting at Greenbush each way with the trains to and from *Boston* and intermediate places, leaving Greenbush daily at 1½ p.m. and 6 p.m., or on arrival of the trains from Boston; leave Troy at 7½ a. m. and 4½ p.m., or to connect with trains to *Boston*

Trains also run hourly on this road between Troy and Albany. Running time between Greenbush and Troy, 15 minutes.

TROY AND SCHENECTADY RAILROAD.

This road is laid its entire length with the heaviest H rail—which is not the fact with the road from Albany. Trains will always be run on this road connecting each way, to and from Buffalo and intermediate places. Leave Troy for Buffalo at 7½ a.m. and 1 p.m. and 6½ p.m., or to connect with the trains for the west; leave Schenectady at 2½ a.m., 8½ a.m., 1 p.m. and 3½ p.m., or on arrival of the trains from Buffalo and intermediate places.

TROY AND SARATOGA RAILROAD.

THE ONLY DIRECT ROUTE.

No change of passenger, baggage or other cars on this route. Cars leave Troy for Ballston, Saratoga Springs, Lake George and White Hall at 7½ a.m., (arriving one hour in advance of the train from Albany,) and at 3½ p.m. Returning, leave Saratoga at 9 a.m. and 3½ p.m., (reaching Troy in time for the evening boats to New York.) Cars also leave Troy for the Burrough at 3½ p.m. and 7 p.m., connecting with packet boats for the north. This takes passengers from New York and Boston to Montreal in 44 hours.

N.B. Travellers will find the routes through Troy most convenient and economical, and as expeditious as any other. The steamboats to and from New York land within a few steps of the railroad office, and passengers are taken up and landed by the different railroad lines at the doors of principal hotels, thus saving all necessity for, and annoyance from, hack drivers, cabmen, runners, etc.

Aug. 3, 1846. 1y 32

THE BEST RAILROAD ROUTE TO THE Lake and Buffalo, from Cincinnati.

Take Cars to Xenia, 65 miles; take Stage to Mansfield, 88 miles; thence by Cars to Sandusky, 56 miles to the Lake; thence Steamboat to Buffalo, 230 miles.

Fare from Cincinnati to Sandusky	$8 00
" " Sandusky to Buffalo, Cabin	6 00
" " " " " Steerage	4 50

Fare by this route, although the cheapest across the state, will be reduced in a short time, railroad lengthened, and speed increased.

Leave Cincinnati in the morning, arrive at Columbus at night.

Leave Columbus in the morning, arrive at Sandusky same day.

Leave Sandusky, by Boat, in the morning, arrive at Buffalo next morning in time for the Cars north and east for Niagara Falls, Canada, Saratoga Springs, Troy, Albany, Boston, New York, Washington, or Philadelphia.

Passengers should not omit to pay their fare through from Cincinnati to Sandusky, or from Columbus to Sandusky via Mansfield; as this route is the only one that secures 56 miles [this road is run over in 2h. 50m.,] most railroad which is new, and is the shortest, cheapest and most expeditious across the state.

Fares on the New York railroads are about to be reduced.

B. HIGGINS, *Sup't, etc.*
M. & S. C. R. R. Co.
Sandusky, Ohio.

RAILROAD IRON.—THE "MONTOUR Iron Company," Danville, Pa., is prepared to execute orders for the heavy Rail Bars of any pattern now in use, in this country or in Europe, and equal in every respect in point of quality. Apply to MURDOCK, LEAVITT & CO., *Agents.*
Corner of Cedar and Greenwich Sts. 42 1y

NEW RAILROAD ROUTE FROM BUFfalo to Cincinnati.

Passengers destined for Columbus and Cincinnati, O., Louisville, Ky., St. Louis, Mo., Memphis, Tenn., Vicksburg, Natches, New Orleans, and all intermediate ports, will find a new, and the most expeditious and comfortable Route, by taking Steamboats at Buffalo, landing at Sandusky City, Ohio, distance ..... 230 miles.

From thence by Cars, over the Mansfield Railroad which is new and just opened [laid with heavy Iron,] to Mansfield, distance	56	"
Thence by Stage via Columbus to Xenia over gravel and Macadamized Road, (the best in the state,) in new coaches, distance	88	"
Thence, over the Little Miami Railroad, from Xenia to Cincinnati, distance	65	"

TIME.

From Buffalo to Sandusky	24 hours.
Leave Sandusky 5 a.m. to Columbus	14 "
From Columbus to Cincinnati	15 "

Or say 30 hours from Sandusky to Cincinnati over this route, including delays.

FARE.

From Buffalo to Sandusky, Cabin	$6 00
" " " " Steerage	3 00
" Sandusky to Columbus	4 50
" " *through* to Cincinnati	8 00

Passengers should not omit to pay their fare *through* from Sandusky City to Cincinnati and take receipts availing themselves of the benefit of a contract existing between the said Railroad and Stage Co's, securing 121 miles travel by good Railroad and 88 miles by Stage, in crossing from Lake Erie to the Ohio river, in the space of 30 hours.

Passengers destined for St. Louis, or any point below on the Mississippi, will save by taking this route, from 4 to 6 days time and travel, and nearly half the expense, over the Chicago and Peoria route to the above places.

Fare by this route, although the cheapest, will in a short time be reduced, Railroad lengthened, and speed increased.

B. HIGGINS, *Sup't, etc.*
M. & S. C. R. R. Co.
Sandusky City, Ohio.

BALTIMORE AND OHIO RAILROAD. MAIN STEM. The Train carrying the Great Western Mail leaves Baltimore every morning at 7½ and Cumberland at 8 o'clock, passing Ellicott's Mills, Frederick, Harpers Ferry, Martinsburgh and Hancock, connecting daily each way with—the Washington Trains at the Relay House seven miles from Baltimore, with the Winchester Trains at Harpers Ferry — with the various railroad and steamboat lines between Baltimore and Philadelphia and with the lines of Post Coaches between Cumberland and Wheeling and the fine Steamboats on the Monongahela Slack Water between Brownsville and Pittsburgh. Time of arrival at both Cumberland and Baltimore 5½ P. M. Fare between those points $7, and 4 cents per mile for less distances. Fare through to Wheeling $11 and time about 36 hours, to Pittsburgh $10, and time about 32 hours. Through tickets from Philadelphia to Wheeling $13, to Pittsburgh $12. Extra train daily except Sundays from Baltimore to Frederick at 4 P. M., and from Frederick to Baltimore at 8 A. M.

WASHINGTON BRANCH.

Daily trains at 9 A. M. and 5 P. M. and 12 at night from Baltimore and at 6 A. M. and 5½ P. M. from Washington, connecting daily with the lines North, South and West, at Baltimore, Washington and the Relay house. Fare $1 60 through between Baltimore and Washington, in either direction, 4 cents per mile for intermediate distances. s13y1

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80 RAILROAD IRON.

Tons	2½	x	¼	Flat Bar Railroad Iron.			
50	"	1½	x	½	"	"	"
8	"	2½	x	½	"	"	"
15	"	1	x	½	"	"	"

with Spikes and Plates, for sale by
A. & G. RALSTON & CO.,
1m30 4 South Front st., Philadelphia.

BALTIMORE AND SUSQUEHANNA Railroad.—Reduction of Fare. Morning and Afternoon Trains between Baltimore and York.—The Passenger trains run daily, except Sunday, as follows:

Leaves Baltimore at	9 a.m.	and 3½ p.m.
Arrives at	9 a.m.	and 6½ p.m.
Leaves York at	5 a.m.	and 3 p.m.
Arrives at	12½ p.m.	and 8 p.m.
Leaves York for Columbia at	1½ p.m.	and 8 a.m.
Leaves Columbia for York at	8 a.m.	and 2 p.m.

FARE.

Fare to York	$1 50
" Wrightsville	2 00
" Columbia	2 12½

Way points in proportion.

PITTSBURG, GETTYSBURG AND HARRISBURG.

Through tickets to Pittsburg via stage to Harrisburg	$9
Or via Lancaster by railroad	10
Through tickets to Harrisburg or Gettysburg	3

In connection with the afternoon train at 3½ o'clock, a horse car is run to Green Spring and Owing's Mill, arriving at the Mills at ..... 5½ p.m.
Returning, leaves Owing's Mills at ..... 7 a.m.

D. C. H. BORDLEY, *Sup't.*
31 1y Ticket Office, 63 North st.

LEXINGTON AND OHIO RAILROAD. Trains leave Lexington for Frankfort daily, at 5 o'clock a.m., and 2 p.m.

Trains leave Frankfort for Lexington daily, at 8 o'clock a.m. and 2 p.m. Distance, 28 miles. Fare $1·25.

On Sunday but one train, 5 o'clock a.m. from Lexington, and 2 o'clock p.m. from Frankfort.

The winter arrangement (after 15th September to 15th March) is 6 o'clock a.m. from Lexington, and ma. 9. from Frankfort, other hours as above.

351y

SOUTH CAROLINA RAILROAD.—A Passenger Train runs daily from Charleston, on the arrival of the boats from Wilmington, N. C., in connection with trains on the Georgia, and Western and Atlantic Railroads—and by stage lines and steamers connects with the Montgomery and West Point, and the Tuscumbia Railroad in N. Alabama.

Fare through from Charleston to Montgomery daily	$26 50
Fare through from Charleston to Huntsville, Decatur and Tuscumbia	22 00

The South Carolina Railroad Co. engage to receive merchandize consigned to their order, and to forward the same to any point on their road; and to the different stations on the Georgia and Western and Atlantic railroad; and to Montgomery, Ala., by the West Point and Montgomery Railroad.

1y25 JOHN KING, Jr, *Agent.*

CENTRAL RAILROAD—FROM SAVANnah to Macon. Distance 190 miles.

This Road is open for the transportation of Passengers and Freight. Rates of Passage, $8 00. Freight—

On weight goods generally	50 cts. per hundred.
On measurement goods	13 cts. per cubic ft.
On brls. wet (except molasses and oil)	$1 50 per barrel.
On brls. dry (except lime)	80 cts. per barrel.
On iron in pigs or bars, castings for mills, and unboxed machinery	40 cts. per hundred.
On hhds. and pipes of liquor, not over 120 gallons	$5 00 per hhd.
On molasses and oil	$6 00 per hhd.

Goods addressed to F. WINTER, Agent, forwarded free of commission. THOMAS PURSE,
40 Gen'l. Sup't. Transportation.

MANUFACTURE OF PATENT WIRE Rope and Cables for Inclined Planes, Standing Ship Rigging, Mines, Cranes, Tillers etc., by JOHN A. ROEBLING, *Civil Engineer*, Pittsburgh, Pa.

These Ropes are in successful operation on the planes of the Portage Railroad in Pennsylvania, on the Public Slips, on Ferries and in Mines. The first rope put upon Plane No. 3, Portage Railrord, has now run 4 seasons, and is still in good condition. 2v19 1y

CENTRAL AND MACON AND WESTERN Railroads, Ga.—These Roads with the Western and Atlantic Railroad of the State of Georgia, form a continuous line from Savannah to Oothcaloga, Ga., of 371 miles, viz:

	Miles.
Savannah to Macon—Central Railroad	190
Macon to Atlanta—Macon and Western	101
Atlanta to Oothcaloga—Western and Atlaniic	80

Goods will be carried from Savannah to Atlanta and Oothcaloga, at the following rates, viz:

	To Atlanta.	To Oothcaloga.
On Weight Goods—Sugar, Coffee, Liquor, Bagging, Rope, Butter, Cheese, Tobacco, Leather, Hides, Cotton Yarns, Copper, Tin, Bar & Sheet Iron, Hollow Ware & Castings	$0 50	$0 75
Flour, Rice, Bacon in Casks or boxes, Pork, Beef, Fish, Lard, Tallow, Beeswax, Mill Gearing, Pig Iron and Grind Stones	0 50	0 62½
On Measurement Goods—Boxes of Hats, Bonnets and Furniture, per cubic foot	0 20	0 26
Boxes and Bales of Dry Goods, Saddlery, Glass, Paints, Drugs and Confectionary, per cubic foot	0 20 pr. 100 lbs.	35
Crockery, per cubic foot	0 15 " "	35
Molasses and Oil, per hhd., (smaller casks in proportion).	9 00	12 50
Ploughs, (large,) Cultivators, Corn Shellers, and Straw Cutters, each	1 25	1 50
Ploughs, (small,) and Wheelbarrows	0 80	1 05
Salt, per Liverpool Sack	0 70	0 95

Passage—Savannah to Atlanta, $10; Children, under 12 years of age, half price, Savannah to Macon, $7.

☞ Goods consigned to the subscriber will be forwarded free of Commissions.

☞ Freight may be paid at Savannah, Atlanta or Oothcaloga.

F. WINTER, *Forwarding Agent, C. R. R.*
Savannah, Aug. 15th, 1846. 1y34

GEORGIA RAILROAD. FROM AUGUSTA to ATLANTA—171 MILES. AND WESTERN AND ATLANTIC RAILROAD FROM ATLANTA TO OOTHCALOGA, 80 MILES.

This Road in connection with the South Carolina Railroad and Western and Atlantic Railroad now forms a continuous line, 388 miles in length, from Charleston to Oothcaloga on the Oostenanla River, in Cass Co., Georgia.

Rates of Freight, and Passage from Augusta to Oothcaloga.

On Boxes of Hats, Bonnets, and Furniture per foot ..... 16 cts.
" Dry goods, shoes, saddlery, drugs, etc., per 100 lbs. ..... 95 "
" Sugar, coffee, iron, hardware, etc. ..... 65 "
" Flour, bacon, mill machinery, grindstones, etc. ..... 33½ "
" Molasses, per hogshead $9·50; salt per bus. 20 "
" Ploughs and cornshellers, each ..... 75 "

Passengers $10·50; children under 12 years of age half price.

Passengers to Atlanta, head of Ga. Railroad, $7.

German or other emigrants, in lots of 20 or more, will be carried over the above roads at 2 cents per mile.

Goods consigned to S. C. Railroad Co. will be forwarded free of commissions. Freight may be paid at Augusta, Atlanta, or Oothcaloga.

J. EDGAR THOMSON,
Ch. Eng. and Gen. Agent.
Augusta, Oct. 21 1845 *44 1y

BOILER IRON.—55 TONS ASSORTED Boiler Iron, Nos. 3, 4 and 5, and of widths of 26, 32 and 36 inches, random lengths, in store, and for sale by A. & G. RALSTON & CO.,
1m30 4 South Front st., Philadelphia.

BACK VOLUMES OF THE RAILROAD JOURNAL for sale at the office, No. 23 Chambers street

THE WESTERN AND ATLANTIC Railroad.—This Road is now in operation to Oothcaloga, a distance of 80 miles, and connects daily (Sundays excepted) with the Georgia Railroad.

From Kingston, on this road, there is a tri-weekly line of stages, which leave on the arrival of the cars on Tuesday, Thursday and Saturday, for Warrenton, Huntsville, Decatur and Tuscumbia, Alabama, and Memphis, Tennessee.

On the same days, the stages leave Oothcaloga for Chattanooga, Jasper, Murfreesborough, Knoxville and Nashville, Tennessee.

This is the most expeditious route from the east to any of these places.

CHAS. F. M. GARNETT,
Chief Engineer.
Atlanta, Georgia, April 16th, 1846. 1y1

LITTLE MIAMI RAILROAD.—1846.— Summer Arrangement.

Two passenger trains daily.

On and after Tuesday, May 5th, until further notice, two passenger trains will be run—leaving Cincinnati daily (Sundays excepted) at 9 a. m. and 1½ p. m. Returning, will leave Xenia at 5 o'clock 50 min. a. m., and 2 o'clock 40 min. p.m.

On Sundays, but one train will be run—leaving Cincinnati at 9, and Xenia at 5 50 min. a. m.

Both trains connect with Neil, Moore & Co.'s daily line of stages to Columbus, Zanesville, Wheeling, Cleveland, Sandusky City and Springfield.

Tickets may be procured at the depot on East Front street.

The company will not be responsible for baggage beyond fifty dollars in value, unless the same is returned to the conductor or agent, and freight paid at the rate of a passage for every $500 in value above that amount. W. H. CLEMENT,
19 Superintendent.

GREAT SOUTHERN MAIL LINE! VIA Washington city, Richmond, Petersburg, Weldon and Charleston, S. C., direct to New Orleans. The only Line which carries the Great Southern Mail, and Twenty-four Hours in advance of Bay Line, leaving Baltimore same day.

Passengers leaving New York at 4½ P.M., Philadelphia at 10 P.M., and Baltimore at 6½ A.M., proceed without delay at any point, by this line, reaching Richmond in *eleven*, Petersburg in *thirteen and a half hours*, and Charleston, S. C., in *two days* from Baltimore.

Fare from Baltimore to Charleston $21 00
" " " Richmond 6 60

For Tickets, or further information, apply at the *Southern Ticket Office*, adjoining the *Washington Railroad Office*, Pratt street, Baltimore, to
1y14 STOCTON & FALLS, Agents.

MARAMEC IRON WORKS FOR SALE. By Authority of a power of Attorney from Messrs. Massey and James, I will sell at Public Auction, at the Court House in the city of St. Louis, on *MONDAY, the 2nd day of November next*, the above named valuable IRON WORKS—together with **8,000** ACRES OF LAND, more or less, on which there are several *valuable and productive Farms* open and in cultivation.

The Maramec Iron Works are situated at the Maramec Big Spring, in Crawford Co., Mo., and consist of **1** BLAST FURNACE; **1** AIR FURNACE; **1** REFINING FORGE, with large Hammer for making Blooms and Anchonies;
2 CHEFFERY FORGES for Drawing Bar Iron;
1 ROLLING MILL for Rolling Blooms into Bars and Plates;
1 SAW AND **1** GRIST MILL,

All within 300 Yards of the head of the spring. There are 2 large frame Coal Houses, and all other Buildings necessary, such as Shops and Houses for the workmen.

This Spring is one of the largest in Missouri, discharging at the lowest time 7,000 cubic feet of water per minute. The Ore Bank from which the Ore has been heretofore taken is about 600 yards from the furnace; it is the *Specular Iron Ore*, the best for making Bar Iron, and the quantity inexhaustible.—It is an Iron Mountain, 400 feet above the level of the Maramec River; the ore is entirely uncovered, and there is an easy descent and a good road from it to the furnace.

The lands have been carefully selected by one of the owners with a view to the interest and convenience of the Works, and are situated principally on the Maramec River and its tributaries, embracing the best bottom lands and water powers. The following detatched tracts, comprized in the above quantity, were selected for the advantages they possess;

183½ ACRES in T. 40 N. of R. 8 W. in Sec. 3, near Wherry's Mill, in Osage Co.; entered to secure a very valuable Mill power on the Branca Spring and a good landing on the Gasconade River.

80 ACRES on Benton's Creek, 12 miles from the Works; entered to secure an extensive and valuable Ore Bank 2½ miles from the Maramec, at a point where there is ample water power.

320 ACRES in T. 38 N. of R. 4 W. in Sec. 22 and 28, affording an extensive and valuable water power on the Maramec river.

160 ACRES in T. 37 N. of R. 3 W. in Sec. 4, embraces two inexhaustible and valuable Ore Banks and is 1½ miles from Water power sufficient for a furnace and Grist Mill, and is distant 6 miles from the above site on the Maramec.

80 ACRES in T. 37 N. of R. 8 W. in Sec. 33, including an extensive bank of excellent Ore, and distant 1½ miles from water power on the waters of the Gasconade River, in Pulaski Co., sufficient for Furnace and Mills. All those Banks are of the same kind as the one at the Works, and deemed inexhaustible.

1 LOT, containing nearly one Acre, on the South Bank of the Missouri River, 4 Miles above the town of Hermann, purchased for a warehouse and landing, and is one of the best landings on the River.

The lands above described are well timbered, and have been selected with a view to have an ample supply of wood and coal, for fences, building and other purposes. There are on the land valuable quarries of Limestone well adapted for Fluxes for the Ore, and also good quarries of Rock suitable for building. There are also on the land a great number the finest kind of Springs. A large portion of the lands are bottoms well adapted to the production of Corn and other crops. The Works are situated in a very pleasant and healthful part of the country. The Maramec ore is believed to be admirably adapted to the manufacture of steel.

A further description of the property at this time is considered unnecessary, as those wishing to purchase will no doubt view the property, which will be shown by the Agent, residing at the works.

The terms of payment required will be one-third of the purchase money in hand and the balance in three equal annual payments, secured by mortgage on all the property.

A more particular description of the property will be given, and further conditions of the sale made known, on the day of sale.

JNO. F. ARMSTRONG, Agent.
St. Louis, June 6, 1846.

☞ The Louisville, (Ky.,) Journal, Cincinnati Gazette, Tribune (Portsmouth, O.,) Nashville Whig, Pittsburg Gazette, National Intelligencer, United States Gazette, (Phila.) Railroad Journal (N. Y.,) acd Boston Atlas, will publish the above once a week until the 20th day of October next, and send bills to this office for settlement, and *mark price on first paper.* 18t25

TO RAILROAD COMPANIES AND MANUFACTURERS of railroad Machinery. The subscribers have for sale Am. and English bar iron, of all sizes; English blister, cast, shear and spring steel; Juniata rods; car axles, made of double refined iron; sheet and boiler iron, cut to pattern; tiers for locomotive engines, and other railroad carriage wheels, made from common and double refined B. O. iron; the latter a very superior article. The tires are made by Messrs. Baldwin & Whitney, locomotive engine manufacturers of this city. Orders addressed to them, or to us, will be promptly executed.

When the exact diameter of the wheel is stated in the order, a fit to those wheels is guaranteed, saving to the purchaser the expense of turning them out inside. THOMAS & EDMUND GEORGE,
jm45 N. E. cor. 19th and Market sts., Philad., Pa.

RICH & CO'S IMPROVED PATENT SALAMANDER SAFES.

Warranted free from dampness, as well as fire and thief proof.

Particular attention is invited to the following certificates, which speak for themselves:

TEST No. 10.

Certificate from Mr. Silas C. Field, of Vicksburgh, Mississippi.

On the morning of the 14th ult., the store owned and occupied by me in this city, was, with its contents, entirely consumed by fire. My stock of goods consisted of oil, rosin, lard, pork, sugar, molasses, liquors, and other articles of a combustible nature, in the midst of which was one of Rich's Improved Patent Salamander Safes, which I purchased last October of Mr. Isaac Bridge, New Orleans, and which contained my books and papers. This safe was red hot, and did not cool sufficiently to be opened until 16 hours after it was taken from the ruins. At the expiration of that time it was unlocked, when its contents proved to be entirely uninjured, and not even discolored. I deem this test sufficient to show that the high reputation enjoyed by Rich's Safes is well merited. S. C. FIELD.

Vicksburgh, Miss., March 9th, 1846.

Certificate from Judge Battaile, of Benton, Mississippi.

In October last I purchased one of Rich's Improved Salamander Safes, which was in the fire at the burning of my law office, and several adjoining buildings in this place, on the 17th of November last, at about half-past one o'clock A. M. of that day. The building was entirely consumed; and I take pleasure in stating that my papers in said safe were preserved without injury. A receipt book which was in said safe, had the glue drawn out of its leather back by the heat, and the back broken; but the leaves of the book, and the writing thereon, were entirely uninjured; and some of the writing which was of blue ink, was also left wholly uneffaced and not in the least faded. Said safe was by the fire heated perfectly red hot, and I do not hesitate to say, that said safe is a perfect security against fire. But the safe tumbled over during the fire, and being heated red hot, the outer sheeting of the door became pressed in, and the bolts of the lock bent, so that it could not be unlocked, and I had to have it broken open. JOHN BATTAILE.

Benton, Miss., December 27, 1845.

Still other Tests in the Great Fire of July 19, 1845.

The undersigned purchased of A. S. Martin, No. 138½ Water street, one of Rich's Improved Patent Salamander Safes, which was in our store, No. 54 Exchange place. The store was entirely consumed in the great conflagration on the morning of the 19th inst. The safe was taken from the ruins 52 hours after, and on opening it, the books and papers were found entirely uninjured by fire, and only slightly wet—the leather on some of the books was parched he extreme heat. RICHARDS & CRONKHITE.

New York, 21st July, 1845.

One of Rich's Improved Salamander Safes, which I purchased on the 2d of June last of A. S. Marvin, 138½ Water street, agent for the manufacturer, was exposed to the most intense heat during the late dreadful conflagration. The store which I occupied, No. 46 Broad street, was entirely consumed; the safe fell from the 2d story, about 15 feet, into the cellar, and remained there 14 hours, and when found, I am told, and from its appearance afterwards, should judge that it had been heated to a red heat. On opening it, the books and papers were found not to have been touched by fire. I deem this ordeal sufficient to confirm fully the reputation that Rich's safe has already obtained for preserving its contents against all hazards. (Signed,)

WM. BLOODGOOD.

New York, 21st July, 1845.

The above safes are finished in the neatest manner, and can be made to order at short notice, of any size and pattern, and fitted to contain plate, jewelry, etc. Prices from $50 to $500 each. For sale by

A. S. MARVIN, General Agent,
138½ Water st., N. Y.

Also by Isaac Bridge 76 Magazine street, New Orleans.

Also by Lewis M Hatch, 120 Meeting street Charleston, S. C. 16 tf

CUSHMAN'S COMPOUND IRON RAILS etc. The Subscriber having made important improvements in the construction of rails, mode of guarding against accidents from insecure joints, etc.—respectfully offers to dispose of Company, State Rights, etc., under the privileges of *letters patent* to Railroad Companies, Iron Founders, and others interested in the works to which the same relate. Companies reconstructing their tracks now have an opportunity of *improving* their roads on terms very advantageous to the varied interests connected with their construction and operation; roads having in use flat bar rails are particularly interested, as such are permanently available by the plan.

W. Mc. C. CUSHMAN, *Civil Engineer*,
Albany, N. Y.

Mr. C. also announces that Railroads, and other works pertaining to the profession, may be constructed under his advice or personal supervision. Applicaitons must be post paid.

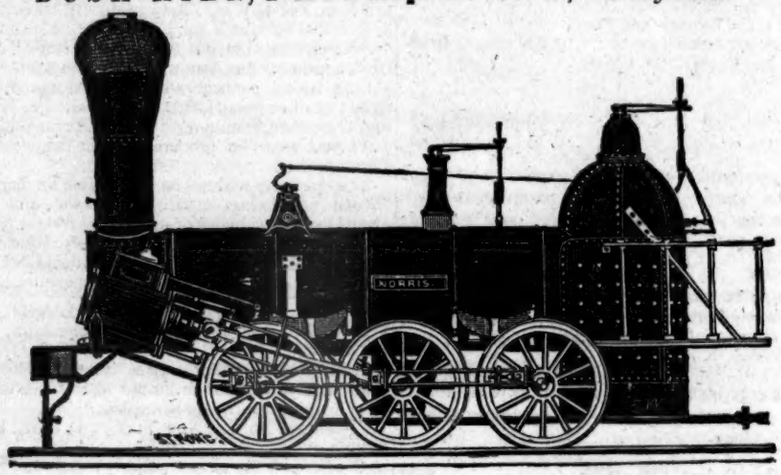
RAILROAD IRON AND LOCOMOTIVE Tyres imported to order and constantly on hand by A. & G. RALSTON
Mar. 20tf 4 South Front St., Philadelphia.

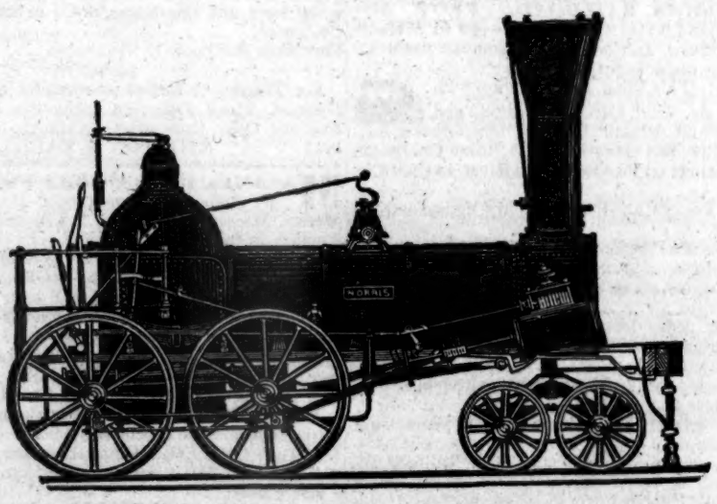
THE NEWCASTLE MANUFACTURING Company continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack screws, Wrought iron work and Brass and Iron castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention. ANDREW C. GRAY,
a45 President of the Newcastle Manuf. Co.

NORRIS' LOCOMOTIVE WORKS.

BUSH HILL, PHILADELPHIA, Pennsylvania.





MANUFACTURE their Patent 6 Wheel Combined and 8 Wheel Locomotives of the following descriptions, viz:

Class	1,	15	inches	Diameter of	Cylinder,	× 20	inches	Stroke.
"	2,	14	"	"	"	× 24	"	"
"	3,	14½	"	"	"	× 20	"	"
"	4,	12½	"	"	"	× 20	"	"
"	5,	11½	"	"	"	× 20	"	"
"	6,	10½	"	"	"	× 18	"	"

With Wheels of any dimensions, with their Patent Arrangement for Variable Expansion.

Castings of all kinds made to order: and they call attention to their Chilled Wheels, for the Trucks of Locomotives, Tenders and Cars.

NORRIS, BROTHERS.

Mathematics] as a Branch of Professional Study.

Euclid's Doctrine of the Line and Plane.

Most readers who have considered our previous remarks with attention will acquit us we are sure, of all captious motives in our criticism upon any part of the ancient geometrical treatises. At the same time, from the concluding paragraph of the preceding number of this series, they will be prepared to anticipate our maintaining serious objections to the ancient compositions upon that branch of geometry which relates to space of more than two dimensions. The subject, in fact, does not appear to be one in which they felt themselves to be masters; and indeed the writings of Euclid are the only ones in which it is really certain that an attempt to embody the discussions in a systematic form was ever made by the Platonic geometers—or even till very recent times. Isolated subjects, it is true, involving space of three dimensions, were discussed by different geometers; but except Euclid's eleventh and subsequent books no regular and symmetrical treatise is recorded to have been even attempted by them.

We need only look into a few of Euclid's definitions in the opening of his eleventh book to be convinced that his grasp of these subjects was less firm, and his views less matured, than when he was treating of plane figures. In fact, *the very style of thinking is altogether different;* and we must confess, that, but for the concurrent testimony in favor of Euclid's being the author of these books, the *internal evidence* against that view is so powerful on our own mind, as to almost lead us to reject the belief of the copaternity of Euclid to the first ten, and to the subsequent books of "the elements."

Take for instance the definitions of the circle, (*i.*, *defs.* 15, 16,) and of the sphere, cone, cylinder, (*xi.*, *defs.* 14—22,) as specimens. In the former case the figure is defined by an absolute property, and has a hypothetical previous existence; in the latter the figures are defined by their geneses, and are not hypothetically pre-existent. Those geometers who are familiar with the discussions which have arisen respecting the introduction of the idea of motion into pure geometry, will appreciate the force of this discrepancy;—it is a fundamental one—a discrepancy in the first principles of geometricizing. Can two principles so diametrically opposed have been employed by the same geometer? and that geometer one so critically scrutinizing and discriminative as the inventor of the *Porism?*

Take as another instance, the dihedral and the solid angle (*xi.*, *defs.* 4, 6, 9,) in comparison with the plane angle (*i.*, *defs.* 9, 10.)—In the definition of the plane angle, as we have already remarked, the aim appears to have been to restrict the popular signification of "a household word" to a special signification:—that of only carrying into geometry the *idea of inclination* when we employ the term angle. Surely it might have been thought that as the idea of inclination was so familiar in plane geometry as this use of it shows, it must have been equally clear when referred to a plane as when to a line. At any rate, a sloping wall, a sloping lawn, or a sloping roof, is amongst ourselves as familiar a notion as a sloping may-pole, or a sloping beam. Why it should have been different in Athens or Alexandria, it is possible that "profound Grecians" may be able to tell us—but they have not told us yet. Mark however, how Euclid treats this subject. He defines a plane angle by the inclination of its legs to one another; and then proceeds to define the inclination of two planes by a plane angle! In short, that an angle is an inclination in the first place, and in the second that an inclination is an angle! Again, if a solid angle, he gives only a popular description: it is "*that* which is made by the meeting in one point of three or more plane angles which are not in the same plane." There is in this no allusion to inclination, nor to any characterizing property, beyond giving a name to a figure formed of a certain assemblage of plane angles. We do not, indeed, object to this definition viewed in itself; but mention it as characterizing, in connection with the other two, an extremely vague conception of the nature of angular magnitude in general. In truth, we consider that this is the foundation of the difficulty in which Euclid was trammelled in his composition of the doctrine of the line and plane.

But to return. We find that his definition of a right angle *in plano* is made to depend upon the general definition of a rectilineal angle, whilst the *dihedral* right angle is conceived, not only apart from the general definition of a dihedral angle, but altogether independently of it. There is in fact, no reason, *a priori*, that the definition viewed as a particular case (that of the adjacent dihedral angles being equal, *def.* 6,) might not actually clash with that which he has given in *def.* 4; and this consideration is of itself sufficient to prove the illogical character of Euclid's process. Still, our argument so far, is rather intended to show the discrepancy of the views under which the first and the eleventh books were composed, than to enforce the absolute inaccuracy of the process employed in the latter book—though we think it will be difficult to defend even the logic of the parts to which we have adverted. We shall presently consider that book somewhat more particularly under this aspect.

There is another circumstance to which we may call attention under the aspect of discrepancy of manner. It is, that in the very early parts of his first book, the practice of *supra-position* of figures is brought into effective play; whilst in the eleventh book, there is not to be found the slightest efficient trace of the method. At the same time it will appear from the three interpolated propositions (A, B, C,) of Simson's edition, how effective—nay, how essential—the method becomes in the case where he (Simson) employs it.—The reader who goes through those propositions, and notices carefully their functions in some of the succeeding demonstrations, will almost be ready to question our accuracy when we tell them that they are *not* substituted for other propositions which are left out in that edition, but actual interpolations. If he will consider the *hiatus* that existed at this place of the work, he will wonder how such inconclusive results could have proceeded from the pen of Euclid. It is the more remarkable that Euclid should have adopted such a mode of reasoning, or rather have rejected a principle in his reasoning, that would have cleared away so much inconclusiveness with so little real trouble. Neither is it in the case of *conclusiveness alone*, that the rejection of the hypothetical transfer of lines and planes have been injurious to his perspicuity. He might also have conferred upon this subject much greater simplicity, even where the logic is perfectly conclusive, by the adoption of this hypothetical transfer, or by the very effective method which has been employed by the French in their descriptive geometry—the method of *rabattement.**

These are not by any means all the discrepancies which may be pointed out in the *essential character* of the methods employed in the first and eleventh books of Euclid; but they are of themselves, we think, sufficient to cloud our admission of the same authorship with a considerable degree of doubt. It is, indeed, barely possible that they might have been so composed, at different and very distant intervals of the life of the same person; and if so, our impressson would be that the eleventh book was composed long antecedent to the first.

It is *assumed* by Euclid, and that without even giving the formal statement of it as an axiom, that if two planes which meet be cut by two profile planes,† the angles contained by the one pair of lines of section is equal to the angle contained by the other pair. Is this really so obvious a truth as to justify its assumption without even formal specification? Is it more obvious, for instance, than (*Prop.* XVI.,) that "if two parallel planes be cut by a third plane, the sections will be parallel?"—Is it more obvious than (*Prop.* X.,) that "if two straight lines which meet one another, be parallel to two others which meet one another though not in the same plane with the first two, the first two and the other two shall contain equal angles?" Thus much, at least, is certain; that as a proposition it admits of a legitimate demonstration; and that this demonstration cannot be (at least it never has been) effected without the aid of the last quoted proposition, or something tantamount to it. Not only, therefore, is Euclid's conception of an angle defective in point of clearness, but the reasoning by which he proceeds in the use of it is inconsequential, and therefore, invalid.

We have already referred to Euclid's rejection of the method of hypothetical supraposition as an instrument of demonstration.—The treatment of the equality of two dihedral angles is a case in point, not only of the ad-

* It is worthy of remark, however, that though the principle of *rabattement* is used in the first and second propositions of the eleventh book, it occurs nowhere else; though it would have been very effective in other parts, and is in those particular ones unnecessary.

† We use this word in a sense sufficiently familiar to most of *our* readers; but it may be worth while to state generally, that *the profile plane is that which is perpendicular to the intersection of the other two.*

vantage, but of the almost absolute necessity, for its employment in this branch of geometry. He defines the equality of two "inclinations," by the equality of their corresponding profile angles; while in his first book he establishes the equality of two angles by showing the necessary coincidence of the position of their containing legs—the hypothesis of the theorem and the transposition of the fixing parts of the figures being admitted. Most of the French geometers who have even adopted Euclid's definition of the dihedral angle have seen the necessity of proving the equality of all profile angles made in the same pair of planes, of which necessity we have already stated our own views: but the more recent authors have adopted the method of supraposition in this argument, with such good effect as might have been anticipated. Perhaps however, Lefebure de Fourcy, (in the introduction to his Descriptive Geometry,) has carried it out with more of the elegant simplicity that characterizes his writings than any other author—not excepting even the clear, concise, and perspicuous Vincent; or the careful, scrutinizing and cogent Legendre.

An opinion seems to have ever prevailed that the line as a geometrical element is a simpler object than a plane; and this has always exhibited itself by elementary writers bringing it into consideration *previously* to the plane. All our works on analytical geometry, too, where we should have expected the equations themselves to have impressed a contrary doctrine in the mind, bear witness to this prevalent notion. Such writers are however, for the most part, mere routinists—their only difference, each from his predecessor, being in some matters of mere detail, and never ascending to anything connected with general principles, and least of all with first principles. If we may use a homely comparison, (of more force perhaps in earlier times than in the present,) we should say, that the first writer on any such subjects, is "the bell-wether whose tinklings the whole flock instinctively follow." The individual components of the herd may turn a few feet to one side of their leader's track or to the other, to avoid their mutual jostling: but the same general line of march is preserved by all, and kept as faithfully as if their scientific safety were perilled by any marked departure from it. All men possess the "right of private judgment:" but how few are able to avail themselves of it, even when conceded to the full!

In respect to the doctrine adverted to, Euclid appears to be the great "bell-wether."—The most remote and complex case of perpendicularity in a natural system, is that of the *line to the plane;* and this is testified by the complexity of the definition of this case of perpendicularity given by Euclid, and after him by every writer on the subject. It is even a subject of ordinary discovery by intelligent and attentive students, to whom the definition is for the first time propounded, that for aught which appears, the things assumed may be incongruous with each other.

A good deal of artificial inconvenience is created by the practice of giving the *entire* of the definitions relating to any one mathematical subject, in the outset of a book or section. Some writers, (amongst English ones, Lardner and Leslie, and amongst the French, Vincent,) wait till a definition is *required*, to introduce it; and it has been attempted by some metaphysicians to meet the objection to which we have just adverted, by viewing it merely as misplaced in the development of the geometrical system. Were this indeed, all the objection that we feel to Euclid's fourth definition, we should have scarcely thought it needed any specific notice. It is, no doubt, proved, (and proved too, by Euclid with an elegance fully equal to that by which any other author has proved it,) that "if a straight line stand at right angles to each of two straight lines at their point of intersection, it shall also be at right angles to every other line passing through that point and situated in the plane which contains those two lines." It therefore follows, that a straight line *can be* at right angles to every line passing through a given point in a given plane, *if it can be at right angles in two of them.* It is remarkable, however, that Euclid nowhere proves this proposition; and that the writers who have attempted it are extremely few. We do not at this moment recollect any English writers except Cresswell* and Lardner who have considered this to be necessary. Neither of these authors has however, made any material impression on the public mind.

The mere absence of a clear proof is, undoubtedly, a serious objection, in such a writer as the author of the "Elements:" but it assumes a graver character when looked at in reference to its implication of the state of his views on this subject. The fundamental canon of logical definition is violated in this case, viz: "to give as many conditions as shall confine the thing to be strictly what it is and no more." If two few, the definition so given may belong to other things besides that under consideration, and is therefore incomplete: if two many, the added ones must be either superfluous or contradictory. If superfluous, they are *properties* of the figure defined, and hence require a *proof*, subsequently to, and dependent on, the definition itself.

By a different arrangement in the order of consecutive dependencies, all this might have been avoided; and the antecedent consideration of the dihedral angle would have removed much of the confusion of ideas—yes, the whole—of which most persons are conscious, when they have read the first half of the eleventh book. We hold that perspicuity is the first and highest test of the naturalness of a scientific development; and in this respect, the book in question is singularly deficient.

But even if we adhere to Euclid's own arrangement in this respect, the superflous conditions, which are introduced into his definition of a line at right angles to a plane ought to have been avoided—as evidently they might with the greatest ease have been, under the influence of a clear conception of the subject. For instance, take the following obvious route;

Def. "When a line is perpendicular to any two lines in the plane, at their point of intersection, it is said to be perpendicular to the plane."

Prop. "When a line is perpendicular to a plane, it is perpendicular to every straight line in that plane which meets it."

This we believe, is very nearly the form in which every careful student is led by his own reflections to place the matter; and under this form too, we know that some of our most able teachers are in the habit of placing it before their pupils' minds in the outset.

Another singular instance of Euclid's vagueness is in *Prop.* vii of this book. He has framed that proposition merely for its use in the next:—whilst it is contained entirely in the definitions of the plane and parallel lines. Thus, the lines being parallel they are in one plane; and a plane superficies is that in which any two points being taken, the straight line which joins them lies wholly in that plane, *defs.* 35 *and* 7, *book i.* These are definitions only, and as the "proposition" follows without the aid of an axiom, or the use of any theorem, it is only a modified statement of congruity of the two definitions we have quoted. Euclid however, not perceiving this has given a formal demonstration, *ex absurdo.*

We grant that the arrangement and dependent demonstrations of the 4th, 5th, 6th, 8th, 9th, and 10th propositions follow each the other with much elegance; and indeed, we consider this particular feature to be the main beauty of the eleventh book. At the same time, this entire series would find a more fitting place much further onwards in the development of the subject. They are more akin, especially the first named four, to the 18th and 19th, and would be advantageously placed posterior to them, provided these themselves were demonstrated in the way they might be.

It is unnecessary to dwell further on these topics, than just to allude to the extremely *gauche* demonstrations given, not by Euclid only, but by most (all?) subsequent writers, of *prop.* 21. Euclid indeed, only gives the first case in his demonstration, the trihedral angle, though he enunciates it generally; the second or general case of the demonstration is by Simson; and the *cor.* 1, *prop.* 32, *book i.*, is interpolated by him for that purpose. We shall hereafter propose a new demonstration of this property, much more simple and intelligible, and equally conclusive with that in the "elements."

We have dwelt at greater length than we intended upon these topics; and yet have not put down the half that we could urge in fa-

* Cresswell, from his writing during the transition period of the Cambridge mathematical taste, was treated with a neglect that was perhaps natural under the circumstances, but which we are sure is a most unjust criterion of the value of his works; and Dr. Lardner had to sustain, in respect to his writings, a large share of the hostility which was brought to bear upon the then newly founded college in Gower street—whose interests admitted of being wounded through his side. We are, indeed, as well aware as the most captious of our readers can be, that Lardner's works are very unequal; yet they bear undeniable marks of intellectual ability, and his Euclid certainly possesses many meritorious points—although we would not be understood to recommend it as a whole.

vor of our view of the subject. We have indeed, touched many of the points to which we have adverted too lightly; but we have only expressed our honest convictions formed many years ago, and enforced by every subsequent year's reflection on these questions. Should mathematicians be found who differ from us, all we ask of them is, to scrutinize the solid geometry of Euclid, with the same honest and earnest desire to arrive at correct views that we have done; and should they then be led to entertain an opinion different from ours, we shall entertain the same respect for them that we should in case of their proceeding further in our own route than we have done. We feel convinced, however, upon one point:—that whatever opinion any geometer may entertain as to the merits of Euclid's development of the geometry of space in a *logical* point of view, no one will be found to contend for its *completeness*. Properties fully as numerous as those which he has given of plane triangles are required in the *application of solid geometry to practical purposes;* and that without our going further into the subject than the inclinations, parallelisms, and perpendicularities of lines and planes, and the trihedral angle. The pyramid, cone, cylinder, and sphere, to say nothing of the general surfaces of the second order, are also *essential* subjects of study, when we study with a practical aim. Will any one contend for the *completeness*, then, of Euclid's writings on this subject?

We scarcely need add that we would on no account recommend Euclid's twelfth book as a subject of professional study—nor even the latter half of the eleventh. They all relate to quadrature and cubature; the truths at which they arrive are very limited; and the reasonings by which they are obtained, (though the "method of exhaustions" is a very subtle and refined method of proof,) are so much more complex than more modern forms of demonstration, (albeit, the same, or nearly so in principle,) as to render it an almost entire waste of time to enter into them. They are amongst the very simplest of the applications of the Integral Calculus; and, even without having recourse to that method, the method of limits, which is by our best writers considered the true foundation of the calculus itself, will enable us to obtain truths far more recondite and general than those at which Euclid has arrived. "What, then, Mr. editor, do you recommend?" We will answer *presently*.

Miscellaneous Items.

The earnings of the Mohawk railroad continue to be highly favorable. For the week ending 7th Aug., the receipts were,

Passengers,	$2,788 03
Freight,	372 96
Total,	2,890 99
Same week last year,	2,556 23
Excess in 1846,	$334 76

The above earnings are the largest since 1841, when the running expenses were twice as large as they now are.—*Argus.*

Michigan Central Railroad.—The receipts upon this road for the month of July, 1846 and 1845, are as follows:

1846.		
From passengers,	$10,417 65	
For freight,	7,054 27	
Trans. U. S. mail,	872 71	—18,344 63
1845.		
From passengers,	$8,280 94	
From freight,	5,484 74	
Trans. U. S. mail,	890 11	—14,655 79
Increase,		3,688 84
Total amount of receipts upon this road since the last report (November 30, 1845,) up to the 31st of July, 1846, inclusive are,		$180,492 35
Amount received in corresponding time, 1845,		86,589 74
Increase,		$93,902 61

The following statement will exhibit the quantity of wheat and flour received at the depot of the Central railroad in Detroit, for the year ending July 31st, 1846:

Flour,	249,555 bbls.
Wheat,	71,221 bush.

Which is equivalent to 265,381 barrels of flour, or equivalent to 1,184,318 bushels of wheat.—*Detroit Adv.*

Stonington Railroad.—Receipts in

July, 1845,	$10,125 98
Do. 1846,	17,989 50

The net increase of income from the Pennsylvania public works to 1st instant, over the same period last year, is $21,235.

Railroad.—The directors of the Connecticut and Passumpsic rivers railroad met at Wells River last Tuesday, when they proceeded north to examine the route, and designed to be at Sherbrooke on Friday.

At their meeting at Wells river, a resolution was passed, we understand, directing a committee of the board to make contracts forthwith for building a certain portion of the road, intending to have it completed as soon as the Lebanon road shall be put in operation to the Connecticut.

The board are firm and determined to go straight forward and complete the enterprize as soon as it can be done. That it may be retarded by the radical measures of the government, like other enterprizes, they, as well as other men, are not without fears.

The survey north of Wells river has reached a point some three miles north of Stevens' village.—*Caledonian.*

Erie Railroad.—It is said that upon the decision of the commissioners that the railroad shall be made on the easiest and cheapest route, one hundred miles of the road were ordered to be put under contract at an early day. —*Jour. Com.*

Luxuries of Orange County.—The milk brought down the Erie railroad weighs, with the cans, thirty-five thousand tons a day. It is much richer than the milk which our citizens have heretofore used, and yet is sold much cheaper. The quantity of fruit brought down is very great—40,000 baskets of strawberries on one day in "strawberry time."—*Ibid.*

Loan Obtained.—The Madison (Ind.) Banner informs us that the Madison and Indianapolis railroad company, through their agent, J. F. D. Lanier, Esq., of that city, have succeeded in negotiating in the city of New York a loan of $100,000 on favorable terms. This will enable the company to complete the road to Indianapolis by the 1st of March next. The first year the receipts were $23,000; the second $43,000; the third, $62,000; and will probably reach $100,000 the present year.

Little Miami Railroad.—We are gratified to be able to call attention to the advertisement announcing the arrival and departure of a daily train of cars to and from Springfield and Cincinnati. It will be seen by the superintendant's notice, that on and after Thursday next, the 13th, a passenger train will leave Cincinnati daily, at half past nine o'clock, a.m., for Springfield, and that a similar train will leave Springfield for Cincinnati daily, at 35 minutes past 4 o'clock a.m. The fare between the two points is $2—distance 84 miles—sufficiently low. The afternoon train from Cincinnati, and the afternoon train from Xenia, will be discontinued after this week.—*Springfield Republic.*

By the following letter from the president of the Cleveland, Columbus and Cincinnati railroad company, says the Cleveland, Ohio, Plaindealer, it will be seen that a portion of the above road is immediately to be put under contract.

OFFICE OF THE CLEVELAND COLUMBUS, AND CINCINNATI RAILROAD CO.

Cleveland, July 25, 1846.

Dear Sir: In reply to your request for information as to our movements here in reference to a subject of great interest to this part of Ohio, I have to say, that we have determined to make a specific location of our railroad, to some point not less than 40 miles, probably to Harrisville, beginning as soon as we can get our engineers; say latter part of August. About the same time we shall advertize for proposals, and shall hope to make the contracts by the 1st of October. We have not secured subscriptions enough to complete the 40 miles, but believe we shall make up the deficiency without much trouble. From Harrisville we can take either the Wooster, or Ashland, or Delaware, or Mansfield and Mt. Vernon lines, as the inducements may be. The 40 miles may be made in 12 months probably, but I flatter myself before half that time elapses, 40 miles beyond may be placed under contract; and within a year, the whole line to Columbus. Whether this shall be so depends entirely upon the exertions of the people on the several lines. If they know their own interest and will act as judicious men should, they will furnish the means with a liberal hand. That the road, if made 40 miles, will be continued on to Columbus, I have no doubt; and if so, that it will pay good dividends, I have as little doubt. The difficulty is in making a beginning on a work of this magnitude; but the hazard of this, we here shall assume, and shall only ask our friends below to carry on what we begin, and shall finish to a point so remote as to inspire confidence in the completion of the whole line.—Let this be done, and we shall have friends enough I have little fear.

That this road would add five, and perhaps ten times its cost to the value of the real estate within a range of 15 or 20 miles each side of it, is a proposition susceptible of almost mathematical demonstration, unless the results shall be an exception to those in all parallel cases, and I can see no reason for that. If I am correct in my theory, and if the stock will pay but the legal rate of interest, then this increased value will be obtained without any expense; and if any easier mode exists by which men can add to their property, and not only without doing injury to those about them, but at the same time conferring absolute benefit

upon them, then I am yet to learn what that method is.

Very respectfully, etc.,

JOHN W. ALLEN,
Prest. C. C. & C. R. R, Co.

H. B. CURTIS, Mt. Vernon, O.

A Powerful Locomotive.—Mr. Ross Winans, of Baltimore, has just done one of four powerful locomotives which he is building for the Reading railroad, and is to be used in the transportation of heavy coal trains. The weight of this engine is 22 tons; its extreme length 25 feet; cylinder 16 1-2 inches in diameter: stroke of steam-rod 20 inches. Its power is equal to that of 250 horses, and it is estimated that it will drag, over ordinary grades, 1,000 tons, gross weight, at the rate from 10 to 12 miles an hour. It runs on eight wheels, all of the same size, and all geared to the driving apparatus; thus giving not only an increase of power, but also rendering the engines less liable to run off the track. A short trip was made by the engine, when it worked very satisfactorily. The American says:

"By a very simple contrivance he has given the engineer the power to contract or expand the exhaust pipe, enabling him to increase or diminish the draft at his pleasure, and thus giving him all the facilities which are generally rendered by a blower. This effectually overcomes the objection which is usually urged against coal on account of the heat of the fire being dampened every time that a fresh supply of fuel is put on.

In order to overcome the crusting over of the fire and the choking of the grate by slag, Mr. W. has built the fire spread much wider and not so deep as is usual. In the present instance the width of the fire-spread extends clear to the inner flange of the wheel. The end attained by this is two-fold. The bed of coals being wider it need not be so thick, and the opportunity for passing a draft through it is thus much better. In the second place the heat in no one part of it being so great as when the bed of fire is thicker, the slate and other refuse of the coal is not so apt to melt and run together, thus forming slag and clinkers. Another improvement in Mr. W.'s engines is to be found in the construction of a door below the one at which the fuel is put in, so that the fireman can get at the very centre of the fire, and, with the aid of his poker, effectually break up any crust that may be forming."

Instantaneous Stopping of a Railway Train.—We, (says Galignani's Messenger of Tuesday,) stated yesterday that we had received an invitation to be present at some experiments with a new break, having for its object the instantaneous stoppage of a railroad train without the slightest shock to the passengers, and that it was our intention to attend. The experiment took place yesterday afternoon at 49 bis. in the Rue Chaussee d'Antin, on a model railway constructed for the purpose. The inventor is an engineer named Alexandre, who has been, it appears, assiduously occupied for four years in bringing the invention to perfection. A model train was let off at different rates of speed, from fifteen or twenty leagues an hour, down a very inclined plane, and yet, notwithstanding these circumstances, the train was checked without the slightest commotion. The break is worked by the conductor of the last carriage, by which means the whole of the carriages, instead of striking each other have a tendency to retreat. As soon as the breaks of the last carriage have taken their position, those of every other carriage in the train act instantaneously, and by another admirable contrivance the locomotive can, even at the greatest rate of speed be detached from the train. This is not all. The very act of separating the locomotive provides against accident from its running too far forward, for as soon as it has reached a sufficient distance from the train, say fifty to one hundred yards, it stops. We shall not enter into any technical details of the mode in which all this is effected, for they could be understood by only a few of our readers, but as far as the results are concerned we feel convinced that the invention is good. The inventor estimates the expense of adopting his apparatus at a thousand francs for each carriage, which is a small sum, if we consider the importance of the object in view. A commission appointed by the government, have witnessed and it is said, approved of the experiments.

English Iron Trade.

The following quotations are from the London Mining Journal, of 1st August. It will be seen by the remarks of the editor, that they anticipate much benefit to the iron trade from the new American tariff, and also from its introduction, for ship building, into France. We think, however, that the home demand will insure them remunerating prices.

	£.	s.	£.	s.	d.
Bar *a* Wales—ton	8	5—	8	10	0
" London	0	0—	9	5	0
Nail rods	0	0—	10	5	0
Hoop (staf.)	0	0—	11	10	0
Sheet	0	0—	12	10	0
Bars	10	10—	11	0	0
Rails, average	9	10—	10	0	0
Welsh cold blast foundrey pig	0	0—	5	5	0
Scotch pig *b* Clyde	3	12 6	3	15	0
Russian, CCND *c*	0	0—	16	0	0
" PSI	0	0—	16	0	0
" Gourieff	14	5—	14	10	0
" Archangel	0	0—	13	12	6
Swedish *d*, on the spot	11	0—	11	10	0
" Steel, fagt	0	0—	15	10	0
kegs *e*	14	0—	14	5	0

a, discount 2½ per cent.; *b*, net cash; *c*, discount 2½ per cent.; *d*, ditto; *e*, in kegs ½ and ¼ inch.

Iron [Welsh and Staffordshire] is in good demand at quotations. Scotch pigs have improved within the last few days, and large sales have been made at 72*s.* 6*d.* to 75*s.*

Messrs. Whitcomb & Barton, Old Broad st., say: English bar iron continues in great request, at a shade under our quotations, and large sales made during the week, delivered at the port. Welsh and Staffordshire pig iron are rather more sought after, and holders are asking higher prices. Scotch pig iron very firm at 72*s.* 6*d.* for mixed Nos., and 75*s.* for all No. 1—cash in 14 days. Sales of spelter reported at £18 7*s.* 6*d.*—to-day holders have refused £18 10*s.*

From a correspondent.

Iron in good demand, and full prices realised.—Sales of Scotch pig have been made at 72*s.* 6*d.* for mixed Nos. at Glasgow. Swedish steel is flat.

DUDLEY, July 29.—The temporary dullness which has characterized the iron trade the last few months may now be said to be over. Orders are coming in plentifully, and briskness begins again to be the order of the day. Considering the good prospects of the trade for many years hence, the probability is that an advance in prices will shortly take place. It should be understood, that though there had been a slackness in general, prices have been maintained, except by a few houses whose terms of doing business afforded no criterion of selling prices.

ENGLISH ENGINEERS.—One of our large engineers has now on hand work to execute for the French government sufficient to keep employed 500 men for two years—and other engineers have so many orders to complete, that they require more than a year to put new work in hand.—*Patent Journal.*

In our last Journal we announced the importation of British sheet iron into France, free of duty, as at length about to be conceded by the minister of commerce, under a royal ordonnance, *as a boon to the shipping interest*—and this concession we are disposed to regard as the first step to the importation of British iron for railways; it being equally essential to the *political and commercial interests of France*, that British iron should be permitted to be used in the construction of the lines requiring despatch in their formation—seeing the make of iron in France cannot supply all the requirements for railways and other purposes, *without delaying the completion of works of the utmost national importance.*

In connection with the foreign demand for iron, it is satisfactory to hear the American tariff has *passed the house of representatives* by a majority of 19, and is now before the senate. The new scale of duties upon iron, as sent to the senate, provides for iron in bars, blooms, bolts, hoops and pigs, rods, slabs, or other form not otherwise provided for;—castings of iron, old and scrap iron, and vessels of cast iron, to pay a duty of 30 per cent., ad valorem. We transcribe the tariff of 1842, at present in operation, which shows at an exchange to equal 4*s.* 2*d.* per dollar. Pig iron to pay a duty of £1 17*s.* 6*d.* per ton; bar iron, £3 10*s.* 10*d.* to £5 4*s.* 2*d.* per ton; sheet, boiler plates, and some other sorts of manufactured iron, £11 13*s.* 4*d.* per ton, with duties more or less on other descriptions; iron for railways, since 3d March, 1843 (as provided in the act of '42) have been chargeable with the duty imposed on rolled iron of £5 4*s.* 2*d.* per ton. The passing of the new tariff by the senate must, consequently, be of considerable importance to the British iron trade. In the house of lords, on Monday last, 55 railway acts of parliament for new lines, extensions, etc., received the royal assent; and the meeting of the directors of the London and York was unanimous for carrying out the works of this railway [308 miles] with all possible dispatch—the year 1850 being named as the period for its completion.

We have again to congratulate the iron trade on a period of prosperity *not hitherto experienced*; and the continued favorable weather for the harvest, with the prospect of tranquility at home and abroad in political affairs, cannot fail to have a beneficial influence on *all judiciously directed railway enterprizes.*

(Official) Reading Railroad.

A comparative statement of the business on the Philadelphia and Reading railroad for the week ending

	Aug. 3, 1844.	Aug. 2, 1845.	Aug. 1, 1846.
Travel	$2,407 91	$2,626 17	$3,073 85
Freight on goods.	806 41	926 66	2,247 37
Do. do. coal..	11,122 80	27,507 48	55,301 45
Miscell's receipts.	....	....	....
Transp. U.S. mail.	....	....	....
	$14,337 12	$31,060 31	$60,622 67
Coal trans., tons..	9,899	25,483	38,711

A comparative statement of the business on the Philadelphia and Reading railroad for the week ending—

	Aug. 10, 1844.	Aug. 9, 1845.	Aug. 8, 1846.
Travel	$2,375 85	$2,444 92	$3,267 54
Freight on goods.	703 72	926 48	2,116 47
" coal..	13,563 86	25,947 77	51,321 62
	$16,343 43	$29,319 17	$56,705 63
Coal trans.—tons.	11,835	24,298	36,076

A comparative statement of the business on the Philadelphia and Reading railroad for the week ending—

	Aug. 17, 1844.	Aug. 16, 1845.	Aug 15, 1846.
Travel	$2,245 38	$2,530 09	$3,092 28
Freight on goods.	758 83	978 65	2,096 62
" coal..	13,622 73	25,495 38	45,909 17
	$16,626 94	$29,004 12	$51,098 07
Coal trans.—tons.	12,129	33,820	31,651

A comparative statement of the business on the Philadelphia and Reading railroad for the month ending July 31st,

	1844.	1845.	1846.
Travel	$10,848 87	$11,542 84	$14,982 72
Freight on goods.	3,227 32	4,020 34	10,818 24
Do. do. coal..	48,182 62	113,155 72	214,802 28
Miscell's receipts.	....	....	15 50
Transp. U.S. mail.	783 33	783 34	783 34
	$63,042 14	129,502 24	241,402 08
Coal trans., tons..	42,849	104,502	150,090

Correspondents will oblige us by sending in their communications by Tuesday morning at latest.

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AMERICAN RAILROAD JOURNAL.

PUBLISHED BY D. K. MINOR, 23 Chambers street, N.Y.

Saturday, August 29, 1846.

Faber's Magnetic Water Gauge.

Some time since, we copied an account of this invention from a Pittsburg paper, prefacing it by some remarks of our own. These remarks have, it seems, given offence to the inventor, who has furnished us with the following statements and certificates, which we publish with the greatest readiness.

Nothing was farther from our mind than to give offence or hurt the feelings of any one; but we noticed the invention precisely for the reason, that it offered means of saving human life, and stated that in the opinion of competent judges, these means were not to be relied upon.

The statements appended are certainly highly favorable, and we should have published them without any other comment, did they not contain a somewhat uncourteous doubt of our veracity. To this we feel bound to reply.

In the year 1838, a commission was appointed by the U. S. government, under act of congress, to inquire into certain inventions, and to examine generally the means of preventing the bursting of steam boilers. The gentlemen constituting the commission were Prof. Renwick, Prof. Silliman and Mr. W. C. Redfield, of this city, well known as a man of science, and practically engaged in the construction and management of steam engines. Among the inventions laid before the commissioners, was one by Mr Aaron Balderstone Quinby, which was intended to show the level of the water in the boiler, by the action of magnets. The contrivance was ingenious, but the reasons assigned, the uncertainty of the action of magnets at high temperatures and in the presence of such large masses of iron, were sufficient to place this among those inventions which were not recommended. We presume that this report may be found among the congressional documents for 1839. That these statements are correct, the writer of this article, who was secretary to the commission, is prepared to maintain, and willing to prove to any one.

As to the invention of Mr. Faber, we never doubted its ingenuity or asserted its want of originality. The construction differs from that proposed by Mr. Quinby, but like it depends upon the same principle. There is one point upon which the gentlemen, whose names appear below, have misunderstood us. The difficulty lies in the operation of the assigned cause, to impair rather than destroy the power of magnets, and in the danger that the power so impaired may, particularly in boilers which are not stationary, become insufficient to overcome friction and other resistances—and so fail in its indications.

That heat *does* impair the power of the magnet, is well determined. Mr. Christie has shown that above 100 deg., a portion of the power of a magnet is permanently destroyed, and that its power is weakened by every increase of temperature.—[Phil. Trans. 1824.]

Still no one would be more pleased than we should to find that so beautiful a contrivance should prove serviceable to mankind, and if by furnishing a large excess of power Mr. Faber can still retain enough to render the indications of his machine trustworthy—as they seem to have been in the cases noted below—no one would more readily aid in making known the merits of the invention. We cannot, however, allow our word to be doubted, when we have only asserted what is known, and well known, matter of fact.

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To the Editor of the Railroad Journal:

Sir: I have just been informed of an article published in your Journal, relating to the Magnetic water gauge, an invention of mine, calculated to retard its introduction into use. An instrument, having for its object the protection of life and property, as my invention does, deserves more attention than you seem to have given it, and a fair trial to test its merits. In view of this, I appeal to your sense of justice in allowing this and the accompanying certificates a place in your columns.

The instrument has been closely observed by me, from the time I put it into use—more than twelve months since—and I have found it at all times to be a perfect indicator of the level of the water, and the magnet the chief feature in the invention, to retain, unimpaired, its attractive influence.

I think you are equally mistaken in your supposition, that the invention is not original. If it is not, I should like to know when, and by whom, an instrument of the kind has been proposed for use.

George Faber.

Canton, Ohio, July, 27, 1846.

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To the Editor of the Railroad Journal:

Sir: I presume that you can have no objection to correct the impression—if found erroneous—made by your remarks, prefatory to the account of Faber's magnetic water gauge, as inserted in your Journal of June 20th, from the Pittsburg Advocate.

You object against the instrument, that the magnet will not retain its power, at the heat to which it will be exposed, and that its action will be uncertain in the presence of so large a body of iron, as is contained in a steam boiler. So far as the experience of more than a year will go, both of your objections have been disproved in practice. Mr. Faber has had an instrument upon his boiler for fourteen months, exposed to the view of the public and witnessed by thousands; any one of wh. m will testify that so far as his observations have extended, it has acted through that period with precision in indicating the true level of water.

The statements of Dr. H. Stidger and Mr. F. A. Schneider, of Canton, Ohio, are herewith handed you. They are both men of accute observation, and have had excellent opportunities for examining the instrument. Dr. Stidger is a man of considerable science, and rare mechanical talent; and Mr. Schneider has verified his opinion by placing two of the instruments upon the boilers of the engine in his gun barrel factory.

Mr. Faber is by no means one of the quack inventors of the age. His knowledge of mechanics is extensive, and skill as a machinest of the first order. As a man of honor, he has withheld the instrument from sale until its merits were fairly tested, and its construction perfected, by observation and labor. Neither has he relied solely upon his own judgment in the matter. The instrument has been submitted to men of science at home and abroad—to skillful engineers, and to the test of use in both high and low pressure boilers, in the employment of men no way interested in their success, and approved by them. In no instance have the objections raised by your article been stated by them. One of the instruments is now on the boiler of the engine of Stillman, Allen & Co., at the Novelty Works, and though not in a situation to do it full justice, works correctly. Another one either now is, or in a few days will be, placed upon the boiler of Mr. Bartol, in the upper part of the city, where its operations can be examined.

In one of the experiments made under my direction in Pittsburg, the whole instrument was subjected to as high degree of heat as was possible by the aid of steam in a high pressure boiler, sufficient for whole days to convert water instantaneously into steam, when applied to its face or outward circumference; and yet it continued, and still continues, under the same circumstances, to act correctly. In that situation it was seen by the intelligent editor whose remarks you have copied—and, upon my invitation, by many of the first engineers and steam engine builders in the city; among whom I will refer to Alexander Birkbeck, Esq., engineer U. S. N., and formerly of New York. Not one of these gentlemen, so far as I could learn, expressed a doubt of its capacity for usefulness.

It was also exhibited at the national fair, at Washington, and carefully examined by the most scientific men who attended it, with the same result. I will refer at present to but one more authority—Mr. Seth Boyden, of Newark, N. J.—upon whose judgment, experience and candor, any one—wishing information on the subject—may safely rely.

You also assume that the invention is not original, and in this, too—in my opinion—you are mistaken. The very intelligent examiners in the patent office—after careful examination—decided that it was original. That matter, however, we are willing to test, whenever the question shall arise, in the proper tribunal.

Lewis Vail,
Agent for Patentee.

Speedwell Iron Works, N. J. August 8, 1846.

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Mr. Vail: My attention has been called to an article in the American Railroad Journal, on the subject of the magnetic water gauge, invented by our townsman, Mr. George Faber.

I do not know that anything I can say will be of use in refuting attacks made on the value or originality of the invention. But if close observation, frequent inquiries and conversations with Mr. Faber, can be supposed to enable me to determine its value, in any particular, I feel free to give my opinion, and the result of my observations, and let them go for so much as they may be worth.

It is now more than a year since the magnetic water gauge was, by Mr. Faber, placed in his boiler. Very frequently, within the time mentioned, have I seen it, and witnessed the truthfulness of its operation. Of one fact alluded to in the remarks the American Railroad Journal, I can speak of confidently. The power of the magnet, as indicated by its action upon the needle suspended on the dial of the gauge, has not been impaired during ten months use, either by heat, or the presence of all the iron usual about boilers. Its action was as perfect at the end of ten months, as when first observed by me.

I have also witnessed some experiments made by Mr. Faber, with the view to determine whether steam would impair the attractive power of the magnet; all of which show conclusively that the power of the magnet is preserved, under that degree of heat

necessarily raised in generating steam—and in no-wise impairing its usefulness for the purpose to which Mr. Faber has applied it.

There are other instruments in use in our town than the one referred to above. I have also seen the operation of them; thus far they operate equally well with that placed in the boiler of Mr. Faber, of which I have spoken. The owner will doubtless testify frankly to its utility, as observed by himself.

With respect, your friend and humble serv't,

HARMAN STIDGER.

Canton, July 27, 1846.

I have frequently observed the operations of Mr. George Faber's magnetic water gauge, and have at all times found it to indicate with accuracy the height of the water in the boiler. So well am I convinced of the reliance which may be placed in its correctness, that I have lately had one fixed in each of the two boilers of my engine. I ought to add that I am not myself a sufficient judge in matters of this kind to pronounce on the value of the invention in every respect, but from my intimate acquaintance with Mr. Faber, I am authorized to say that everything contained in his own article on the subject—if my testimony can be of any value—may be implicitly relied on as being true.

F. A. SCHNEIDER.

Canton, July 27, 1846.

Foreign Items.

Embankment of the Bed of the Adige in Tyrol.—The floods of this river have of late caused such damage in the south of the Tyrol, that its embankment has been decided upon—the more important, as its valley is one of the connecting links between Italy and Germany. The court counsellor Dassetti has just completed his report, which is accompanied by an instructive lithographed map of the valley of the Adige, from Meran to Boschetta. After the completion of the cut at Ischia Peratti, another more expensive will be commenced at Ischia Lidorno. The plans for damming up the Noce, one of the most impetuous and mischievous Alpine torrents, are also to be commenced. The expenses will be very great—but only apparently so, as by the regulation of this mighty Alpine stream, 8,800,000 square klafter (cubits) of boggy land will be restored to its pristine fertility, an equal area preserved from the destroying influence of floods, and the air improved for about 50,000 people, who have, hitherto, constantly suffered from fevers and other diseases inherent in damp localities.

General Canal Constructions in France.—Never before has any legislative session been taken up by so many subjects relating to constructions, for the improvement of the working classes, etc. The following is extracted from the Journal des Travaux Publics: "The original plan for the maritime canal of Caen is still carried out with energy; 2,800,000 francs have been alone expended in the erection of one of the four walls of the basin, a new bed for the Orme 2,700 metres long, and the two yettier of Oysterham. Some angry observations have been made on account of the opening of the Orme having cost 800,000 francs, while the original estimates amounted only to 280,000. 1,200,000 francs have been voted for improving the navigation of the Vilaine in the environs of Rennes, comprising earthwork, excavations, aqueducts, bridges, etc. Now a credit of 15,000,000 francs is asked for the completing of the branch canal to the Garonne, between Toulouse and Casterts." The allusions made by M. Adolphe Beaumonte to English canals, in the chamber of deputies, are not without interest. "In England," said he, "canals give way to railroads. I have spoken in London of our proposed canals, but no one would believe me. The canal from London to Birmingham, which yields 4 per cent., is merely an adventitious exception, because there has sprung up on its banks manufactories, which are its main support. The only remedy against the monopoly of railroads are the railroads themselves. The expense of 15,000,000 of francs for a canal at the present time is an anachronism."

Submarine Vessel.— Some experiments, have been, of late, made with a boat constructed after the plan of Dr. Payerne, and called by him *bateau cloche* (bell ship). It is made of iron, and to be seen near the Pont Royal at Paris, where it is now moored. On its last experimental trip, eleven persons were on board, and the craft passed (invisibly to the public) through the space between the Pont Royal and that of La Concorde. None of the passengers felt the least inconvenience, although there was a sort of telegraph established for communicating with those above water.

Supply of Water to the City of Madrid.—This metropolis is very scantily supplied with water, which the poorer classes have to purchase. An extensive contract (*subasta*) has just been entered upon for supplying it with water for drink and irrigation. The contractor has to furnish the town with 10,000 reals of water (the standard Spanish measure), which is to be available even to the highest parts. The adjudication amounts to the great sum of 71½ millions of reals, and the works are to be completed within the term of two years. If we compare this projected supply with the present which is only 500 reals, it may be easily imagined what a boon will be conferred on the comfort and healthfulness of the humble classes.

New Galvanic Telegraph.—German journals speak of a new discovery of M. Leonhard, watchmaker, at Berlin, relating to the above subject. At present, it has been only executed between Berlin and Potsdam, but it is to be prolonged successively to Brandenburg and Magdeburg. The outer form of the machine is simply that of a wrtting desk—on these, two dials are to be seen. A hand indicates the letter or sign which has been made at the other station. Both machines are connected by metal wire chains, and have been hitherto placed on wooden blocks, but will hereafter be conducted under ground. M. Leonhard is also said to have discovered a new system of railway telegraphs.

The Great Danube Docks at Alt-Ofen, Executed by English Engineers.—The extent of the Danube steam navigation company is such, that they possess at present thirty-seven boats for passengers, and two barges for the conveyance of goods, both combined of 3,926 horse power. The docks of Alt-Ofen, since they have been under the direction of M. Massjohn, who studied in England, have assumed the shape of a real manufacturing colony. Since 1844 alone, there have been built at this place ten boats of 1306 horse power. Thirty iron barges, each of the burthen of 5000 cwt., are in preparation or nearly ready, besides four iron coal barges, and eight for merely conveying pigs and other cattle, one gun boat for the Austrian government, and twenty moveable piers with the boats appertaining thereto. The establishment is now in a position to manufacture in its own workshop all the requisite parts of a steamboat of from 200 to 250 horse power, and even all the tools for ship construction, which hitherto they were obliged to obtain from England. The greatest part of the hitherto wooden building has been replaced by M. Massjohn by fire proof structures, and boats and machinery have been much improved. The passenger boats now ascend the Danube from Pesth to Vienna in 18 hours, and from Vienna to Linz in 17 hours—a considerable saving on former voyages. Boats of 4000 to 5000 cwt. burden do not draw more than four feet water, and can, therefore, safely pass over the sand shoals, which formerly much impeded the navigation of this river. M. Massjohn has also established a superior mode of discipline and order among the 1200 men who constantly work at these docks. Still, the Austrian railroads consume a large quantity of iron, which has had the effect, that the above number of steamboats is only half of what would have been otherwise made. Lately, the dykes around the docks have been heightened for protecting them against the floods, etc. Besides M. Massjohn, both the shipbuilders and chief machinest, Messrs. Pretious & Bissacker are Englishmen.

Supply of Water to the City of Lyons.—It is an inconceivable anomaly that Lyons, situated between two rivers, should have been hitherto entirely deficient of an adequate supply of water for its numerous manufacturing and working population. After many sham proposals of projectors and contractors, the town council are about to take the subject in their own hands, beginning with a complete canalization of the city, and execute the works on a grand scale, letting the public reap the profit of the undertaking.

Deepest Artesian Well in Europe.—In the duchy of Luxembourg, a well is being sunk, the depth of which surpasses all others of the kind. Its present depth is 2336 feet, nearly 984 feet more than that of la Grenelle, near Paris. It is said, that this immense work has been undertaken for working a large stratum of salt rock.—*Civil Engineer.*

The Railway System.

BY MR. CUBITT, C. E.

The following we offer as a condensed and faithful account of the evidence given by Mr. Cubitt before the select committee of the lords. We have divided his plan, as well as we could into sections, notifying the nature of them in italicized side headings. This was done to assist the reader.

Conduct of Existing Railway Companies in Respect to New Schemes.—Established companies spend large sums to secure a district of country for themselves, and to prevent the encroachment of new companies. To effect this, they project schemes not actually required. This evil would be obviated by some general system of lines being planned; and by doing away with local direction and influence. "Men designing a line for their own benefit, or the benefit of a particular company, or a particular class," is a great evil. This, however, is a difficult thing to obviate. Everything is tending to give power to large companies, and, as they get powerful, become proportionately overbearing.

His General System of Management.—"I took the subject of the railway system into consideration in the years 1840 and 1841, when the select committee of the house of commons was sitting upon railways. I then wrote to some members of the committee upon the subject, who I thought understood traffic best, and I propounded a plan to Mr. Loch, the honorable member for the Wick District Burghs, who well understands traffic, and he very much approved of the communication, but it was not in a form that could be brought before the committee, nor was I called upon by the committee to explain any part of the subject; but my opinion then was, and I have seen no reason to change that opinion since, that it would be very desirable to take a certain number of railways which have been in existence a number of years, and to amalgamate them by turning their shares into common stock at its then value, so as to combine all in one common stock, instead of forming a fresh company; that the same proprietors should hold as proprietors of the common stock, instead of holding as members of this or that company, and that then, as time ran on, every railway which had been at work a certain number of years, and upon which a fusion or amalgamation would take place, would then merge into the common stock, and exchange their shares for stock receipts at a certain number of years' purchase, say, twenty years' purchase of their profits. That would bring every shareholder into the concern without loss; it would bring all the property into a common stock or railway fund; and there would be a set of proprietors from whom might be elected men of great weight and knowledge and responsibility to form a central board of proprietors for the management of the property, and then the whole should be put under the control of a government board of high standing, a board of control, to whom all references should be made upon public matters, and to whom might be referred additional lines, if thought proper to be made. That is a general outline of what I would suggest. I think such a thing would be better than the present mode. I think it must ultimately come to government control, and that would be the least objectionable mode of control. In the first place, jobbing would be done away with in a great measure by the mode of election of the principal board of direction from which would emanate the district boards, and every railway station in the kingdom would be under one kind of management, and one kind of line of proceedings as to police, as to clerks, as to charges and everything else. Whether you went to a railway office in the north of Scotland or in the south of England, you would have the same treatment, charge, and management.—I would place the practical management of the whole in the proprietary board. It would prevent jobbing amongst directors. The stock would be the finest investment for money that could possibly be. Some other out-of-door control there must be than the company's; I would extend it in this way—that if any body of men in any part of the kingdom thought they could make a railway to answer their purpose, the stockholders, or rather the proprietors, should be allowed to do so by a certain act of parliament; that they should arrange with regard to the land and so on, and go to work for a term of years, and if they should then merge in the general concern at the end of that time, and if it was a loss they should merge, with a deduction for their losses." The board of control should have the power to force a company to make a railway, though it should not pay to a distant town, such being to the public advantage. There would be a difficulty, perhaps, in getting companies to agree to it, but the "companies' amalgamations," now going on, is one step to it. The board of control to attend to railways alone. He had not gone into details of amount of power that board would have.

Gauges.—There would be a difficulty in the way of such an arrangement if two gauges existed. In fact, in any case, there should be but one uniform gauge, which is quite practicable. For himself, he advocated a gauge of six feet, not requiring any alteration of tunnels, etc., and at an expense which would be scarcely felt—the minimum cost being £500, maximum £1,000 per mile for alteration; but had made no decided estimate of cost. Would only have to bring the rails out about eight inches, and put the wheels of carriages at a greater distance, and the wheels would still be within the width of the carriages. This gauge would bring down the centre of gravity lower, which is important to safety. He has the prospect of control of nearly 1,000 miles of railway, between north and south. No difficulty to widen rails on embankments or in cuttings. To alter, would not require to take up the rails; and, in respect to those on cross sleepers, "should simply cut with a saw through the sleeper in the middle of the line, and just put each out 8 inches, and then nail a short piece of wood in to connect the two parts of the sleeper.—The thing would cost very little to do." Make the alteration without stopping the traffic.—Has no doubt that it would be of considerable advantage to the country, in many points of view, that there should be *one uniform gauge* both for traffic and military defences of the country. He would not make one exception, because he did not think one could be found. Thinks this is the best opportunity for the alteration to one uniform gauge. Not a season should be lost. He said, "I think the thing may be easily done, and economically done, and done without loss to the public, and without loss to the companies, and in a very short time, and at a very moderate expense."

Relaying of Croydon Railway.—Now about to relay this entirely with new set of rails and fixtures altogether; which would not stop the traffic, though 80 trains a day run, 40 each way.

The Permanent Way is the most defective part of railway system; rails often too light. "But the great defect is the want of proper attention to the fastenings of the rails and the chairs. I attribute almost all the accidents that have happened from engines and wagons and carriages getting off lines of railway to the imperfect state of the road; and yet, no sooner has an accident happened, than the engineers go to examine the engines, and examine the carriages, to find out what is the matter. Accidents generally happen from the ends of the rails getting out of the joint-chairs, or the end getting loose, which must inevitably throw off the engine; and throwing off the engine, it tears up the line at the place, and we never can see it, because it is done away with. By a somewhat wider gauge, and better engines, we go as safely 100 as 30 miles an hour. It is not from increased speed that engines burst; one of the 90 to 120 small tubes in the boiler bursts, being defective, or being worn thin by use and the particles of coke. One of these tubes bursting, stops the engine. This is less likely to occur at high speeds, because there is then less pressure upon those tubes. Engines, to be more powerful, require to be larger or longer; the latter does not render it more dangerous.

Long Engines working Curves.—The American "Bogie."—The longer engines are between the wheels, the more they are likely to impinge upon the rails in going round very sharp curves; but that is obviated in America by another plan, and I recommend the plan very much to the gauge commissioners. On narrow gauge railways, they cannot go so fast as on broad, because they cannot get as large driving wheels with safety, without carrying the centre of gravity too high. I could make an engine of any length, which should be better adapted for going round curves, than any engines now are.—For instance, an engine twenty feet long might be made perfectly safe and steady with very large driving wheels upon a narrow gauge, even with wheels as large as the Great Western wheels, simply by having what the Americans call a "bogie" carriage—a small carriage with four low wheels moving upon a centre horizontally. Imagine a small truck with four wheels upon the line; then imagine another small truck behind it with four wheels. Now, those wheels and axles would be stronger than the present ones, and lighter. Then, if we support a very long boiler indeed upon those trucks, the trucks with four wheels can each turn independently at each end. Then, anywhere between those we may have large driving wheels without flanges, there being eight other wheels to take the weight at both

ends. We might have the driving wheels of any height; then they would turn round curves very rapidly indeed. I explain this to show that there are no insurmountable difficulties mechanically, for the wheel might be improved in every respect."

Cost of Altering Carriages for his six feet gauge would be £30 each, average; an engine and tender, £350 to £400.

Parties bearing Cost of Alteration of Gauge.—"I think it should be paid for partly by time gone by and partly by futurity; that is to say, money might be taken up at a certain rate of interest for doing this work, either from government or by transferable bonds, payable off by lot; anything of that sort. Then, the works should be paid for as they were done. Whatever they cost should be apportioned, as nearly as it could be, over about forty years; that is twenty by-gone years, and twenty future years of railway extension; and all newly made railways should pay their quota of the alteration as the past had paid; so that in forty years, or forty-five or fifty years, the thing should be paid off, and the work all done. The work should be all done at once, for the sake of the public. It would be paid for in a long time, for the sake of the parties. It would not tax any company harshly to make the alteration, and, therefore, they could not complain of it in point of expense. All the new railways would have to pay a quota for the same thing, although they would make their gauges right in the first instance.

Improve Permanent Way, by good thickness of balasting and keeping the road in good order, to inspect which should be a principal duty of the board of control.

Compensation to Families for fatal accidents should be made by the companies.

Two Central Boards of Control are the main features in his plan; one, the government board of control and inspection; the other, for the railway proprietors. The latter would order sub-boards of management for various districts or lines, all referring to their head board.

Fares.—Would have the same rate of fares throughout the kingdom.—*Herapath's Journal.*

Suppression of Smoke.

A report has been recently addressed to the government, by Sir Henry De la Beche and Dr. Lyon Playfair, respecting the means and effects of preventing the smoke of furnaces. The following extracts will sufficiently explain the conclusions arrived at.

"The general principles upon which the combustion, or rather the prevention of smoke, may be effected are now well known, and admitted to be applicable to practice. Smoke consists of vapors produced by the partial combustion or distillation of coal, carrying up small particles of the fuel in mechanical suspension, and depositing, by the combustion of one of their constituents, carbonaceour matter in a fine state of division. The mode of preventing this smoke is to admit a sufficient quantity of air to effect the combustion of the carbonaceous matter, when the vapors are of a sufficiently elevated temperature to unite entirely with the oxygen of the air. If the temperature be not sufficiently elevated, the hydrogen of the vapors alone is consumed, and the carbon is separated in the fine state of division referred to. The gases produced by the complete combustion of fuel are colorless and invisible, and therefore do not come under the definition of the term smoke.

"As the prevention of smoke implies the complete combustion of fuel, the result, as an abstract statement, always is, that more heat is generated, and a saving of fuel effected, when it is so consumed as to prevent the emission of smoke; but although this theoretical conclusion is undoubtedly correct, the practical results are not always consonant with this statement.

"In consuming smoke in the usual way, a quantity of cold air is introduced into the fire, and as this must be heated up to the temperature of the surrounding fuel, the loss of the latter may be equal to, or even greater than, the saving of the fuel from the combustion of the products of distillation. This often results in the careless use of furnaces constructed on the principle of smoke prevention, and thus leads to the contradictory statements given by those who have used such furnaces. But in all carefully conducted experiments the saving of fuel has been considerable, and the reason of this will be at once perceived, when it is considered that in addition to the combustion of the products of distillation, there is a large amount of fuel saved by the combustion of a gas called carbonic oxide, formed by the proper product of combustion, carbonic acid, taking up in its passage through the incandescent fuel, another portion of carbon, which escapes useless as regards the production of heat, unless burned by the air introduced at the bridge of the furnace, for the purpose of consuming the products of distillation.

"From these considerations, and from experiments conducted under our inspection, with a view to determine this point to our satisfaction, we arrive at the conclusion that although from careless management of fires there is often no saving, and that indeed there is frequently a loss of heat in the prevention of smoke, still that with careful management the prevention of smoke is in many cases attended with, and may in most cases be made to produce, an economy of fuel.

"It may be unnecessary to remind your lordship that the cause of the emission of smoke in manufactories may be classed under three different heads, the relative importance of which involves very different considerations in any attempt to legislate for its prevention. These are—1. The want of proper construction and adjustment between the fire places and the boilers, and the disproportionate size of the latter to the amount of work which they are expected to perform. 2. The deficiency of draught, and improper construction of the flues leading to a chimney of inadequate height or capacity. 3. The carelessness of stoking and management by those entrusted with the charge of the fire places and boilers."

It cannot for a moment be questioned, that the continued emission of smoke is an unnecessary consequence of the combustion of fuel, and that, as an abstract statement, it can be dispensed with. But your lordship will perceive that there are grave difficulties connected with a general law to the effect that it shall be unlawful for chimneys, after a certain date, to emit smoke. With regard to steam engines, the processes for the prevention of smoke have been matured, and in very many instances successfully employed. In this case, therefore, a law to that effect could be most easily and promptly carried out. In other cases mentioned in lord Lincoln's letter, such as distilleries, dyeworks, etc., the legislature has already granted powers in the Manchester local act; and as there are certain instances in which processes for the prevention of smoke have with them proved successful, it may be anticipated hatt the nuisance arising from these sources may be much abated, if they be subjected to the general law with that forbearance and caution which, under certain cases, is so advisable. There are certain processes in glass works, iron furnaces, and potteries, in which it is neither possible nor desirable to apply a general law for the prevention of smoke; although the nuisance may be partially mitigated, by causing the steam engines employed in them to be so constructed as not to emit smoke.

It is useless to expect, in the present state of our knowledge, that any law can be practically applied to the fire places of common houses, which, in a large town like London, contribute very materially to the polution of the atmosphere; but it may confidently be expected, that by a wise administration of a legislative enactment, carefully framed, a great progressive diminution of the smoke of large manufacturing towns will be effected, and that the most happy results will thus flow from this improvement, in the increased health and moral feeling of their population —the intimate connection of which with facilities for cleanliness has been so often pointed out.—*Civil Engineer.*

Statistics of Railway Accidents.—In the late sitting of the Polytechnic society at Berlin, Baron von Reden produced a document to prove that accidents on the different railways in Europe are extremely few in comparison with the number of travellers. We extract the following:—In France, at the period when most accidents occured, in 1842, the time of the great accident of the Versailles left bank, there was 1 accident to 25,000 travellers; in 1844, the most favorable year, the average was 1 accident to 1,320,000 travellers. In England, in 1840, (worst year,) there was 1 accident to 64,000; in 1844, (most favorable year,) 1 to 69,000 travellers. According to this statement, accidents on the English railways are more frequent than on the French. From 1841 to 1845, the accidents on the English railways amounted to 1,057, (993 deaths,) or 1 on 95,000. In Belgium, in 1843, (worst year,) the average was 1 accident on 88,000 passengers; in 1844, 1

on 102,000. From 1835 to 1844, 50 persons were killed and 103 wounded on the Belgian railways. On the railways in Germany, from 1841 to 1845 inclusive, there were only 4 persons killed and 3 wounded. In all Europe the proportion of the hurt or killed on railways to the passengers, was, in the most unfavorable year, 1 in 494,006; in the most favorable year, 1 in 8,889,000. In Prussia, according to M. Reden, 40 to 50 travellers perish every year on the different rivers. In the city of London alone, the annual number of deaths from accidents from carriages amounts to 300.—*Railway Record.*

Pleasure Excursion.—The pleasure excursion of the Eastern Counties seems to have been very successful. Upon the arrival of the train from Yarmouth and Norwich at Shoreditch station, it consisted of fifty-one carriages, all quite full. A local paper says the number of passengers (exclusive of children under three years of age, amounting to about 200, who travelled free) was 1,871 making a total of more than 2,000 persons.—The cheap train has been a subject of great interest during the past week. Norwich is now thronged with visitors from London, who arrived by the London excursion train on Saturday evening; and Yarmouth, the inhatants of which place thought they were going to be ruined by railways, is again, as last week, filled to overflowing. The cheap trains from Ely, Cambridge, etc., etc., last week brought company to such an extent that they could not supply them all either with beds or food. To supply the latter, we are told, six bullocks had to be slaughtered immediately. On Saturday night the great majority of visitors in this train proceeded to Yarmouth, where they arrived between 9 and 10 o'clock, and with a very considerable Norwich train at the same time, the influx of company into Yarmouth could not have been far short of a thousand people.—*Railway Chronicle.*

The Peterboro' and Shirley railroad co. will be organized at Townsend west village, on Thursday next. It is expected that there will be a large meeting of citizens from the towns on the route and beyond. The New Hampshire towns of Mason, New Ipswich, Jaffrey, Brookline, Wilton, Peterboro' etc., are all interested in this railroad, and their business will unquestionably make it a profitable and successful enterprize.

Richmond and Danville Railroad.—The Richmond Whig learns that the internal improvement convention held a few days ago at Charlotte court-house, recommended the construction of a railroad from Richmond to Danville. The contemplated route is the Black Heath coal pits. Mr. Jones, an intelligent engineer, residing in Amelia county, estimates the cost at $8,000 per mile, or $1,200,000 for the entire distance.

THE SUBSCRIBER IS PREPARED TO execute at the Trenton Iron Works, orders for Railroad Iron of any required pattern, and warranted equal in every respect in point of quality to the best American or imported Rails. Also on hand and made to order, Bar Iron, Braziers' and Wire Rods, etc., etc.

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SPRING STEEL FOR LOCOMOTIVES, Tenders and Cars. The Subscriber is engagep in manufacturing Spring Steel from 1¼ to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used, its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address

JOAN F. WINSLOW, *Agent,*
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RAILROAD SCALES.—THE ATTENTION of Railroad Companies is particularly requested to Ellicotts' Scales, made for weighing loaded cars in trains, or singly, they have been the inventors, and the first to make platform scales in the United States; supposing that an experience of 20 years has given a knowledge and superior advantage in the business.

The levers of our scales are made of wrought iron, all the bearers and fulcrums are made of the best cast steel, laid on blocks of granite, extending across the pit, the upper part of the scale only being made of wood. E. Ellicott has made the largest Railroad Scale in the world, its extreme length was one hundred and twenty feet, capable of weighing ten loaded cars at a single draft. It was put on the Mine Hill and Schuylkill Haven Railroad.

We are prepared to make scales of any size to weigh from five pounds to two hundred tons.

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Codorus,
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Have now a supply, and respectfully solicit the patronage of persons engaged in the making of Machinery, for which purpose the above makes of Pig Iron are particularly adapted.

They are also sole Agents for Watson's celebrated Fire Bricks and prepared Kaolin or Fire Clay, orders for which are promptly supplied.

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RAILROAD IRON—1700 TONS VERY Best English Rails, ready to be delivered.—These Rails weigh 60 lbs., the lineal Yard, are 3⅛ inches deep; 4 inches deep at base; 2½ inches wide at top; 17½ feet long, except one-tenth of 15 and 12½ feet in length.

A first rate Steam Pile Driver built by "*Dunham & Co.*," has never been in use, is in perfect order, and for sale a bargain; also 12 Railway Passenger Cars that have never been used, which will be sold very low. DAVIS, BROOKS & CO.,
June 1. 30 Wall Street.

BALLARD'S NEWLY IMPROVED Patent Jack Screw.

The advantages of this Jack Screw for Stonequarries, Railroads, Steam Boiler Builders, and other purposes, are superior to any other machine.

The improvement consists in being able to use either end of the Screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler makers have them in use, by whom they are highly recommended.

JACK SCREWS of various kinds, sizes, power and price, constantly on hand at the manufactory, No. 7 Eldridge St.,
4t35 near Division.

PATENT INDESTRUCTIBLE WATER Pipes. The subscribers continue to manufacture the above PIPES, of all the sizes and strength required for City or Country use, and would invite individuals or companies to examine its merits.—This pipe, unlike cast iron and lead, imparts neither color, oxide or taste, being formed of strongly riveted sheet iron, and evenly lined on the inside with hydraulic cement. While in the process of laying, it has a thick covering externally of the same—thus forming nature's own conduit of stone. The iron being thoroughly enclosed on both sides with cement, precludes the possibility of rust or decay, and renders the pipe truly *indestructible.* The prices are less than those of iron or lead. We also manufacture Basons and D. Traps, for Water Closets, on a new principle, which we wish the public to examine at 112 Fulton street, New York.
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Locomotive steam engines and tenders; Driving and other locomotive wheels, axles, springs & flange tires; car wheels of cast iron, from a variety of patterns, and chills; car wheels of cast iron with wrought tires; axles of best American refined iron; springs; boxes and bolts for cars.

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of all descriptions and of the most improved patterns, style and workmanship.

Mill gearing and Millwright work generally; hydraulic and other presses; press screws; callenders; lathes and tools of all kinds; iron and brass castings of all descriptions.

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25,000 to 30,000 made weekly. 35 1y

RAILROAD IRON.—THE SUBSCRIBER'S New Rail Iron Mill at Phœnixville, Pa., is expected to be ready to go into operation by the 1st of September, and will be capable of turning out 30 to 40 tons or finished Rails per day. They are now prepared to receive orders to that extent, deliverable after the 1st of Octobet next, for heavy rails of any pattern now in use, equal in quality and finish to best imported.

PIG IRON.—They are also receiving weekly 150 to 200 tons of No. 1 Phœnix Foundry Iron, well adapted for light castings.

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Have now on hand, for sale, Railroad Iron, viz:
180 tons 2½ x ½ inch Flat Punched Rails, 20 ft. long.
25 " 2½ x ½ " Flange Iron Rails.
75 " 1 x ½ " Flat Punched Bars for Drafts in Mines. A full assortment of Railroad Spikes, Boat and Ship Spikes. They are prepared to execute orders for every description of Railroad Iron and Fixtures. 1t

VALUABLE PROPERTY ON THE MILL Dam For Sale. A lot of land on Gravelly Point, so called, on the Mill Dam, in Roxbury, fronting on and east of Parker street, containing 68,497 square feet, with the following buildings thereon standing.

Main brick building, 120 feet long, by 46 ft wide, two stories high. A machine shop, 47x43 feet, with large engine, face, screw, and other lathes, suitable to do any kind of work.

Pattern shop, 35x32 fe. with lathes, work benches,

Work shop, 86x35 feet, on the same floor with the pattern shop.

Forge shop, 118 feet long by 44 feet wide on the ground floor, with two large water wheels, each 16 feet long, 9 ft diameter, with all the gearing, shafts, drums, pulleys, &c., large and small trip hammers, furnaces, forges, rolling mill, with large balance wheel and a large blowing apparatus for the foundry.

Foundry, at end of main brick building, 60x45½ feet two stories high, with a shed part 45½x20 feet, containing a large air furnace, cupola, crane and corn oven.

Store house—a range of buildings for storage, etc., 200 feet long by 20 wide.

Locomotive shop, adjoining main building, fronting on Parker street, 54x25 feet.

Also—A lot of land on the canal, west side o Parker st., containiug 6000 feet, with the following buildings thereon standing:

Boiler house 50 feet long by 30 feet wide, two stories.

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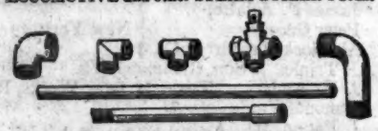

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TO LOCOMOTIVE AND MARINE ENgine Boiler Builders. Pascal Iron Works, Philadelphia. Welded Wrought Iron Flues, suitable for Locomotives, Marine and other Steam Engine Boilers, from 2 to 5 inches in diameter. Also, Pipes for Gas, Steam and other purposes; extra strong Tube for Hydraulic Presses; Hollow Pistons for Pumps of Steam Engines, etc. Manufactured and for sale by

MORRIS TASKER & MORRIS,

Warehouse S. E. corner 3d and Walnut Sts., Philadelphia 1tf

LAP—WELDED

WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM 1 1-4 TO 6 INCHES DIAMETER,

and

ANY LENGTH, NOT EXCEEDING 17 FEET.

These Tubes are of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER,

Patentee.

28 Platt street, New York.

ENGLISH PATENT WIRE ROPES—FOR THE USE OF MINES, RAILWAYS, ETC.—for sale or imported to order by the subscriber.

These Ropes are manufactured on an entirely different principle from any other, and are now almost exclusively used in the collieries and on the railways in Great Britain, where they are considered to be greatly superior to hempen ones, or iron chains, as regards safety, durability and economy. The plan upon which they are made effectually secures them from corrosion in the interior, as well as the exterior of the rope, and gives a greater compactness and elasticity than is found in any other manufacture.

Many of these ropes have been in constant operation in the different mines in England, and on the Blackwall and other inclined planes, for three and four years, and are still in good condition.

They have been applied to almost every purpose for which hempen ropes have been used—mines, heavy cranes, standing rigging, window cords, lightning conductors, signal halyards, tiller ropes, etc. Reference is made to the annexed statement for the relative strength and size. Testimonials from the most eminent engineers in England can be shown as to their efficiency, and any additional information required respecting the different descriptions and application will be given by

ALFRED L. KEMP,

75 Broad street, New York, sole agent in the United States.

Statement of Trial made at the Woolwich Royal Dock Yard, of the Patent Wire Ropes, as compared with Hempen Ropes and Iron Chains of the same strength.—October, 1841.

WIRE ROPES.				HEMPEN ROPES.			CHAINS.		STRENGTH.
Wire gauge number.	Circumference of rope.	Weight per fathom.		Circumference of rope.	Weight per fathom.		Weight per fathom.	Diameter of iron.	Tons.
	INCH.	LBS.	OZ.	INCH.	LBS.	OZ.	LBS.	INCH.	
11	4½	13	5	10	24	–	50	15-16	20
13	3¾	8	3	8¼	16	–	27	11-16	13½
14	3½	6	11	7½	12	8	17	9-16	10½
15	2⅞	5	2	6¾	9	4	13½	1-2	7½
16	2¾	4	3	6	8	8	10½	7-16	7

N.B. The working load, with a perpendicular lift, may be taken at 6 cwt. for every lb. weight per fathom, so that a rope weighing 5 lbs. per fathom would safety lift 3360 lbs., and so on in proportion. 1y24

NICOLL'S PATENT SAFETY SWITCH for Railroad Turnouts. This invention, for some time in successful operation on one of the principal railroads in the country, effectually prevents engines and their trains from running off the track at a switch, left wrong by accident or design.

It acts independently of the main track rails, being laid down, or removed, without cutting or displacing them.

It is never touched by passing trains, except when in use, preventing their running off the track. It is simple in its construction and operation, requiring only two Castings and two Rails; the latter, even if much worn or used, not objectionable.

Working Models of the Safety Switch may be seen at Messrs. Davenport and Bridges, Cambridgeport, Mass., and at the office of the Railroad Journal, New York.

Plans, Specifications, and all information obtained on application to the Subscriber, Inventor, and Patentee G. A. NICOLLS,

ja45 *Reading, Pa.*

LAWRENCE'S ROSENDALE HYDRAulic Cement. This cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by JOHN W. LAWRENCE,

142 Front street, New York.

☞ Orders for the above will be received and promptly attended to at this office. 32 1y

GEORGE VAIL & CO., SPEEDWELL IRON Works, Morristown, Morris Co., N. J.—Manufacturers of Railroad Machinery; Wrought Iron Tires, made from the best iron, either hammered or rolled, from 1½ in. to 2½ in thick.—bored and turned outside if required. Railroad Companies wishing to order, will please give the exact inside diameter, or circumference, to which they wish the Tires made, and they may rely upon being served according to order, and also punctually, as a large quantity of the straight bar is kept constantly on hand.—Crank Axles, made from the best refined iron; Straight Axles, for Outside Connection Engines; Wro't. Iron Engine and Truck Frames; Railroad Jack Screws; Railroad Pumping and Sawing Machines, to be driven by the Locomotive; Stationary Steam Engines; Wro't. Iron work for Steamboats, and Shafting of any size; Grist Mill, Saw Mill and Paper Mill Machinery; Mill Gearing and Mill Wright work of all kinds; Steam Saw Mills of simple and economical construction, and very effective Iron and Brass Castings of all descripions.1

CALIGRAPHIC BLACK LEAD PENcil, Manufactured by E. Wolff and Son, 23 Church Street, Spitalfields, London.

The Caligraphic Pencils have been invented by E. Wolff and Son, after the expenditure of much time and labor. They are the result of many experments; and every effort that ingenuity and experience could suggest, has been made to insure the highest degree of excellence, and the profession may rely upon their being all that can be desired.

They are perfectly free from grit; and for richness of tone, depth of color, delicacy of tint, and evenness of texture, they are not to be equalled by the best Cumberland Lead that can be obtained at the present time, and are infinitely superior to every other description of Pencil now in use.

The Caligraphic Pencils will also recommend themselves to all who use the Black Lead Pencils as an instrument of professional importance or recreation, by their being little more than half the price of other pencils.

An allowance will be made on every groce purchased by Artists or Teachers.

May be had of all Artists, Colourmen, Stationers, Booksellers, etc.

A single pencil will be forwarded as a sample, upon the receipt of postage stamps to the amount.

Caution.—To prevent imposition, a highly finished and embossed protection wrapper, difficult of imitation, is put around each dozen of Pencils. Each Pencil will be stamped on both sides, "Caligraphic Black Lead, E. Wolff and Son, London."

The subscriber has on hand a full supply of Wolff and Sons celebrated Creta Laevis, or Colored Drawing Chalks, also their pure Cumberland Lead and extra prepared Lead Pencils, and Mathematical Lead Pencils.

P. A. MESIER,

Stationer and Sole Agent,

No. 49 Wall Street.

N. B.—A complete assortment of Steven's *Genuine* Inks, Fluids, Imitating Wood stains, and Graining Colours at the Manufacturers prices. 19tf

ENGINEERS' AND SURVEYERS'

INSTRUMENTS MADE BY

EDMUND DRAPER,

Surviving partner of

STANCLIFFE & DRAPER.

No 23 Pear street, below Walnut,

1y10 near Third, Philadelphia.

PATENT HAMMERED RAILROAD, SHIP and Boat Spikes. The Albany Iron and Nail Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes, from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscriber at the works, will be promptly executed. JOHN F. WINSLOW, *Agent.*

Albany Iron and Nail Works, Troy, N. Y.

The above spikes may be had at factory prices, of Erastus Corning & Co., Albany; Hart & Merritt, New York; J. H. Whitney, do.; E. J. Etting, Philadelphia; Wm. E. Coffin & Co. Boston. ja45

PATENT RAILROAD, SHIP AND BOAT Spikes. The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years' successful operation, and now almost universal use in the United States (as well as England, where the subscriber obtained a patent) are found superior to any ever offered in market.

Railroad companies may be supplied with Spikes having countersink heads suitable to holes in iron rails, to any amount and on short notice. Almost all the railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

All orders directed to the Agent, Troy, N. York, will be punctually attended to.

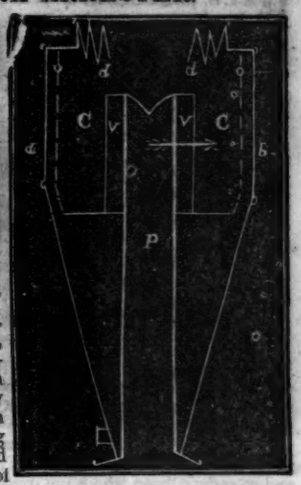
HENRY BURDEN, *Agent.*

Spikes are kept for sale, at Factory Prices, by I. & J. Townsend, Albany, and the principal Iron merchants in Albany and Troy; J. I. Brower, 222 Water St., New York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

*** Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufcturing so as to keep pace with the daily increasing demand.

ja45

FRENCH AND BAIRD'S PATENT SPARK ARRESTER.



TO THOSE INTERESTED IN Railroads, Railroad Directors and Managers are respectfully invited to examine an improved SPARK ARRESTER, recently patented by the undersigned.

Our improved Spark Arresters have been extensively used during the last year on both passenger and freight engines, and have been brought to such a state of perfection that no annoyance from sparks or dust from the chimney of engines on which they are used is experienced.

These Arresters are constructed on an entirely different principle from any heretofore offered to the public. The form is such that a rotary motion is imparted to the heated air, smoke and sparks passing through the chimney, and by the centrifugal force thus acquired by the sparks and dust they are separated from the smoke and steam, and thrown into an outer chamber of the chimney through openings near its top, from whence they fall by their own gravity to the bottom of this chamber; the smoke and steam passing off at the top of the chimney, through a capacious and unobstructed passage, thus arresting the sparks without impairing the power of the engine by diminishing the draught or activity of the fire in the furnace.

These chimneys and arresters are simple, durable and neat in appearance. They are now in use on the following roads, to the managers and other officers of which we are at liberty to refer those who may desire to purchase or obtain further information in regard to their merits:

R. L. Stevens, President Camden and Amboy Railroad Company; Richard Peters, Superintendant Georgia Railroad, Augusta, Ga.; G. A. Nicolls, Superintendant Philadelphia, Reading and Pottsville Railroad, Reading, Pa.; W. E. Morris, President Philadelphia, Germantown and Norristown Railroad Company, Philadelphia; E. B. Dudley, President W. and R. Railroad Company, Wilmington, N. C.; Col. James Gadsden, President S. C. and C. Railroad Company, Charleston, S. C.; W. C. Walker, Agent Vicksburgh and Jackson Railroad, Vicksburgh, Miss.; R. S. Van Rensselaer, Engineer and Sup't Hartford and New Haven Railroad; W. R. M'Kee, Sup't Lexington and Ohio Railroad, Lexington, Ky.; T. L. Smith, Sup't New Jersey Railroad Trans. Co.; J. Elliott, Sup't Motive Power Philadelphia and Wilmington Railroad, Wilmington, Del.; J. O. Sterns, Sup't Elizabethtown and Somerville Railroad; R. R. Cuyler, President Central Railroad Company, Savannah, Ga.; J. D. Gray, Sup't Macon Railroad, Macon, Ga.; J. H. Cleveland, Sup't Southern Railroad, Monroe, Mich.; M. F. Chittenden, Sup't M. P. Central Railroad, Detroit, Mich; G. B. Fisk, President Long Island Railroad, Brooklyn.

Orders for these Chimneys and Arresters, addressed to the subscribers, care Messrs. Baldwin & Whitney, of this city or to Hinckly & Drury, Boston, will be promptly executed. FRENCH & BAIRD.

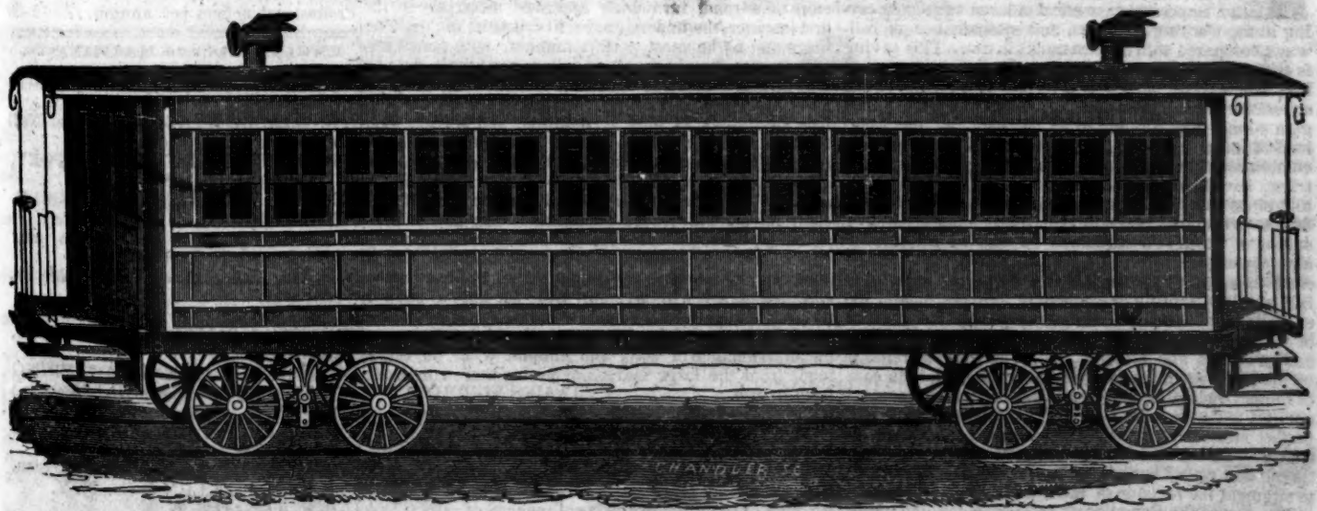
N. B.—The subscribers will dispose of single rights, or rights for one or more States, on reasonable terms.

Philadelphia, Pa., April 6, 1844.

*** The letters in the figures refer to the article given in the *Journal* of June, 1844. ja45

BENTLEY'S PATENT TUBULAR STEAM BOILER. The above named Boiler is similar in principle to the Locomotive boilers in use on ou Railroads. This particular method was invented by Charles W. Bentley, of Baltimore, Md., who has obtained a patent for the same from the Paten Office of the United States, under date of September 1st, 1843—and they are now already in successful operation in several of our larger Hotels and Public Institutions, Colleges, Alms Houses, Hospitals and Prisons, for cooking, washing, etc.; for Bath houses, Hatters, Silk, Cotton and Woollen Dyers, Morocco dressers, Soap boilers, Tallow chandlers, Pork butchers, Glue makers, Sugar refiners, Farmers, Distillers, Cotton and Woollen mills, Warming Buildings, and for Propelling Power, etc., etc.; and thus far have given the most entire satisfaction, may be had of D. K. MINOR, 23 Chambers st. New York.

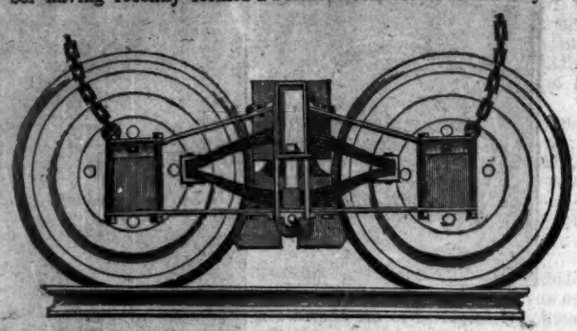
DAVENPORT & BRIDGES' CAR WORKS.



DAVENPORT & BRIDGES CONTINUE TO MANUFACTURE TO ORDER, AT THEIR WORKS, IN CAMBRIDGEPORT, MASS. Passenger and Freight Cars of every description, and of the most improved pattern. They also furnish Snow Ploughs and Chilled Wheels of any pattern and size. Forged Axles, Springs, Boxes and Bolts for Cars at the lowest prices. All orders punctually executed and forwarded to any part of the country

Our Works are within fifteen minutes ride from State street, Boston—coaches pass every fifteen minues. 1y1

RAY'S EQALIZING RAILWAY TRUCK.—THE SUBSCRIBER having recently formed a business connection in the City of New



York, expressly for the manufacture of the newly patented and highly approved Railroad Truck of Mr. Fowler M. Ray, is ready to receive orders for building the same, from Railroad Companies and Car Builders in the United States, and elsewhere.

The above Truck has now been in use from one to two years on several roads a sufficient length of time to test its durability, and other good qualities, and to satisfy those who have used it, as may be seen by reference to the certificates which follow this notice.

There have been several improvements lately introduced upon the Truck, such as additional springs in the bolster of passenger cars, making them delightful riding cars—adapting it to tenders, trucks forward of the locomotive, and freight cars, which, with its original good qualities, make it in all respects the most desirable truck now offered to the public.

Orders for the above, will, for the present, be executed at the New York Screw Mill, corner 33d street and 3d avenue, (late P. Cooper's rolling mills) and at the Steam Engine Shop of T. F. Secor & Co., foot of 9th street, East river, (of which firm the subscriber was late a partner) under the immediate supervision of Mr. Ray himself.

Several sets of trucks containing the latest improvements have recently been turned out for the New York and Erie railroad, and the New Jersey Transportation company, which may be seen upon said roads.

The patronage of Railroad Companies and Car Builders is respectfully solicited.

New York, May 4, 1846. W. H. CALKINS, and Others.

To all whom it may concern:—This is to certify that the New Haven, Hartford and Springfield railroad co., have had in use six sets of F. M. Ray's patent trucks for the last 20 months, during which time it appears to me, they have proved to be the bes and most economical truck now in use.

[Signed,] WILLIAM ROE, Sup't of Power.

I certify that F. M. Ray's Patent Equalizing Railroad Truck has been in use on the Philadelphia and Reading railroad for some time past, under a passenger car.

For simplicity of construction, economy in cost, lightness of material, and extreme ease of motion, I consider it the best truck we have ever used. Its peculiar make also renders it less liable to be thrown off the track, when passing over any obstruction. We intend using it extensively under the passenger and freight cars of the above road.

Reading, Pa., October 6, 1845. [Signed,] G. A. NICOLL,
Sup,t Transportation, etc., Philadelphia and Reading Railroad.

To all whom it may concern:—This is to certify that the N. Jersey Railroad and Transportation company have used Fowler M. Ray's Truck for the last seven months, during which time it has operated to our entire satisfaction. I have no hesitation in saying that it is the simplest and most economical truck now in use. [Signed,] T. L. SMITH,

Jersey City, November 4, 1845. N. Jersey Railroad and Transp. Co.

This is to certify that F. M. Ray's Patent Equalizing Railroad Truck has been in use on the Long Island railroad for the last year, under a freight car.

For simplicity of construction, economy in cost, lightness of material and ease of motion, I consider it equal to any truck we have in use.

Long Island Railroad Depot, Jamaica November 12, 1845. } [Signed,] JOHN LEACH, Sup't Motive Power.

1y19

HERRON'S PATENT AMERICAN RAILWAY TRACK,

As seen stripped of the top ballasting

HERRON'S IMPROVEMENTS IN RAILway Superstructure effect a large aggregate saving in the working expenses, and maintenance of railways, compared with the best tracks in use. This saving is effected—1st, Directly by the amount of the increased load that will be hauled by a locomotive, owing to the superior evenness of surface, of line and of joint. This gain alone may amount to 20 per cent. on the usual load of an engine.—2d, In consequence of the thorough combination, bracing, and large bearing surface of this track, it will be maintained in a better condition than any other track in use, at about one-third the expense.—3d, As action and reaction are equal, a corresponding saving of about two-thirds will be effected in the *wear* and *tear* of the *engines* and *cars*, by the *even surface* and *elastic structure* of the track.—4th, The great security to life, and less liability to accident or damage, should the engine or cars be thrown off the rails.—5th, The absence of jar and vibration, that shake down retaining walls, embankments and bridges.—6th, The great advantage of the high speed that may be safely attained, with ease of motion, reduction of noise, and consequently increased comfort to the traveller.—7th, The really *permanent* and perfect character of the Way, insuring regularity of transit. To which may be added the great increase of travel, that would be induced by the foregoing qualities to augment the revenue of the railroad.

The cost of the Patent track will depend on the quantity and cost of iron and other materials; but it will not exceed, even including the preservation of the timber, the average cost of the tracks on our principal railroads. Generally, the timber structure, fastenings and workmanship, exclusive of the cost of the iron rails, will be from $2,300 to $4,000 per mile. On this structure, rails of from 40 to 50 lbs. per yard, will be equal in effect to 60 and 70 lbs. rails laid in the usual way. The proprietors of a road, furnishing approved materials in the first instance, the undersigned will construct the track on his plan in the most perfect manner, with recent improvements, for one thonsand dollars per mile. And he will farther contract to maintain said track for the period of ten years, furnishing such preserved timber and iron fastenings as may be required, and keeping said track in *perfect adjustment*, under any trade not exceeding 100,000 tons per annum, or its equivalent in passenger transportrtion, for *Two hundred dollars per mile per annum.** To insure the faithful performance of this contract, he will pledge one-fourth of the cost of construction, with the accruing interest thereon, regularly vested, until the completion of the contract. So that a company, by securing payment to the undersigned at the specified period, will have only $750 per mile to pay for the workmanship on the track, without any charge being made for the use of the patent, the subsequent payments, for maintenance of way, and amount withheld, being made from the large margin of profits that will result from its use.

JAMES HERRON.
Civil Engineer and Patentee,
No. 277 South Tenth St., Philadelphia.

* A general average of the repairs done on six of the most successful railroads in this country, for a period of from six to eight years' use has been found to exceed $625 per mile per annum, exclusive of renewal of rails. But few roads in this country carry as much as 100,000 tons per annum. When a road exceeds that quantity, the repairs due to the additional tonnage, up to 200,000 tons, will be charged at one mill per ton; over the latter, and not exceeding 300,000 tons, nine-tenths of a mill, etc. Where there are two tracks to maintain, a large reduction upon those rates will be made. 1y14

THE AMERICAN RAILROAD JOURNAL is the only periodical having a general circulation throughout the Union, in which all matters connected with public works can be brought to the notice of all persons in any way interested in these undertakings. Hence it offers peculiar advantages for advertising times of departure, rates of fare and freight, improvements in machinery, materials, as iron, timber, stone, cement, etc. It is also the best medium for advertising contracts, and placing the merits of new undertakings fairly before the public.

RATES OF ADVERTISING.

One page per annum	$125 00
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J. F. WINSLOW, Albany Iron and Nail Works, Troy, N. Y. (*See Adv.*)
TROY IRON AND NAIL FACTORY,
H. Burden, Agent. (*See Adv.*)
ROGERS, KETCHUM AND GROSVENOR, Patterson, N. J. (*See Adv.*)
S. VAIL, Speedwell Iron Works, near Morristown, N. J. (*See Adv.*)
NORRIS, BROTHERS, Philadelphia Pa. (*See adv.*)
KITE'S Patent Safety Beam. (*See Adv.*)
FRENCH & BAIRD, Philadelphia, Pa. (*See Adv.*)
NEWCASTLE MANUFACTURING COMPANY, Newcastle, Del. (*See Adv.*)
ROSS WINANS, Baltimore, Md.
CYRUS ALGER & Co., South Boston Iron Company.
SETH ADAMS, Engineer, South Boston.
STILLMAN, ALLEN & Co., N. Y.
JAS. P. ALLAIRE, N. Y.
PHŒNIX FOUNDRY, N. Y.
ANDREW MENEELY, West Troy.
JOHN F. STARR, Philadelphia, Pa.
MERRICK & TOWNE, do.
HINCKLEY & DRURY, Boston.
C. C. ALGER, Stockbridge Iron Works, Stockbridge, Mass.